

# THE SEA BEE



KOREA KWAJALEIN NORMANDY OKINAWA PHILIPPINES SALERNO TARAWA TRINIDAD TULAGI VIET NAM

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**REAR ADMIRAL**

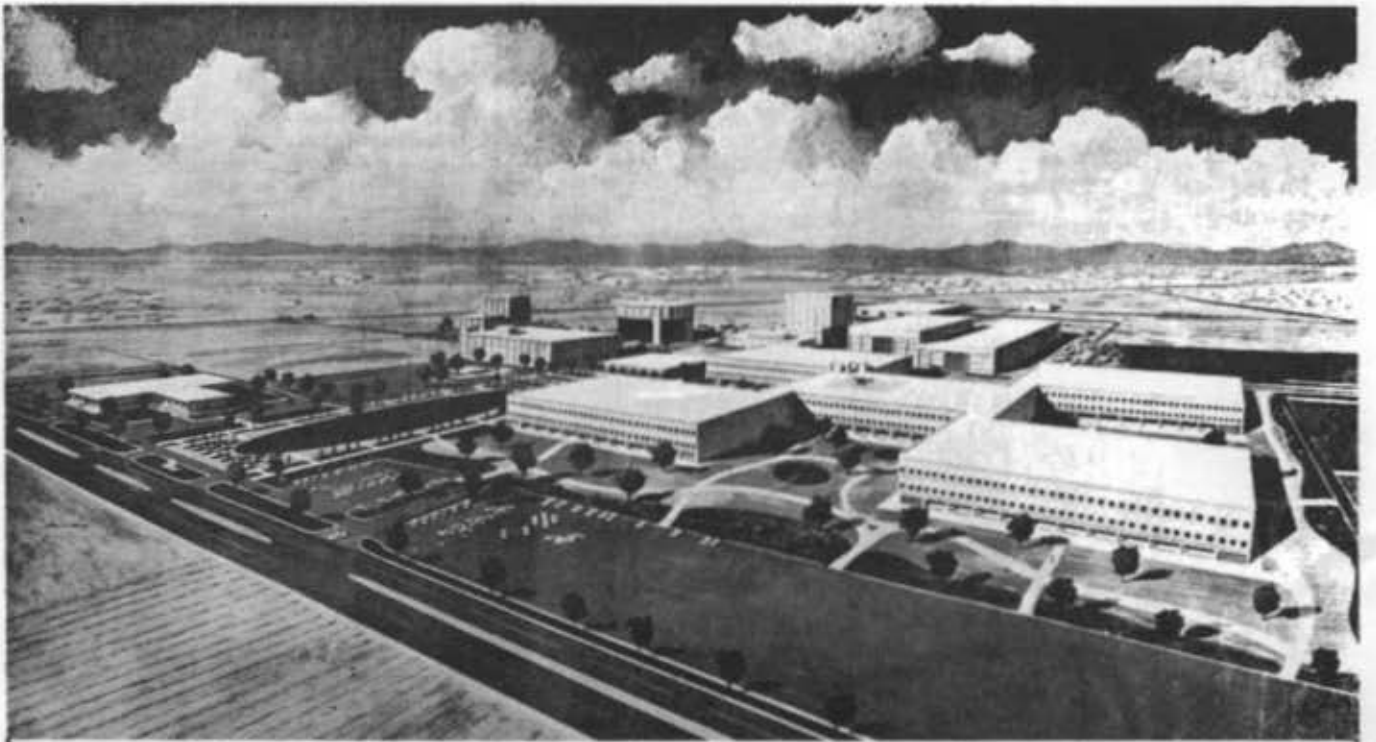
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This morning, for instance.

John Carpenter awoke at 7:27. He blinked and, turning his head, noticed the flickering pattern of light filtering through the trees outside the window. It would be a fine day for golf. He smiled happily. And stretched. And at precisely that moment realized he was alone in bed.

John Carpenter frowned and, hearing a slight noise from the direction of the kitchen, swung out of bed and padded barefoot down the hall in search of Barbara.

It was a good sight. Barbara and the baby. And strong steaming coffee already made. And the kitchen fresh and warm and gleaming. All the debris from last night's party gone. Hard to believe there'd ever been a clutter of half-filled glasses and sticky plates. That dishwasher had been a good investment.

Barbara had said it would be. That it would be a real work-saver and give her the time to enjoy just this kind of relaxed, leisurely Saturday morning. She had, in fact, insisted on

having a complete G&S kitchen, including a modern gas range and oven. And she had been right. They know how to build them.

John Carpenter felt thoroughly content and comfortable in his castle. He leaned down and kissed his wife. He kissed her again. And decided to stay home.

(After all, he could play golf next week.)

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Photo shows new three F-1 test stand addition at NASA High Thrust Area, Edwards California, constructed under supervision of the Los Angeles District, U. S. Army Corps of Engineers. Test Stand 1-E is on left with water recovery reservoir. Also shown is Test Stand 1-D in foreground right and Test Stand 1-C adjacent.



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# THE SEA BEE



THIS ISSUE

of

The SEABEE

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## TIME FOR ALLEGIANCE

From: THE ENCINIAN — Encino, California

Although we realize the duties of a community newspaper are far removed from reporting the complexities of the international scene we feel that in this era of protests, and protests against protests, Americans must stand up and be counted.

Few of us understand the blunt reality of the war in Vietnam; many of us are confused about the pros and cons of still another "cold war." Yet the basic remains . . . the blood of American servicemen is being shed.

It seems to us that very least we can give, in these times of confusion and despair, is undivided and unwavering support to the courageous husbands and sons and brothers who are sacrificing their lives for a yet-to-be-determined cause.

The pleas for withdrawal from Vietnam, and the dramatic burning of draft cards in protest of shedding still more blood on foreign soils may echo a deeply-felt sentiment, wrongly directed.

It seems to us the point is not withdrawal. We, as Americans are committed. We are committed to defending oppressed nations; we are committed to upholding the democratic belief that all peoples should be relieved from the terroristic tactics employed by the Viet Cong, and before them, the Gestapo of the Hitler regime. Because we are a nation founded on the premise that all men are created equal, we must defend our allies when this premise is challenged.

As Life Magazine so poignantly phrases it: "The war in Vietnam cannot be fully told in accounts of heroic battle against the enemy. The war is like none ever fought by Americans in a foreign land because of an inescapable paradox. We cannot defeat this armed enemy unless we win the people; yet unless we defeat the armed enemy, we cannot win the people.

"It might surprise many Americans to learn how many of our fighting men in Vietnam understand this dilemma perfectly and how many of them are dedicated to resolving it, by humanity as well as by force," the article concludes.

If your American servicemen are willing to sacrifice their lives for a paradox: a stepping stone to the ultimate curbing of the creeping threat of Communism; cannot we, as Americans basking in the riches and comfort of a gloriously free nation, give them our undivided support?

And most of all, cannot we give our allegiance to an action taken, not necessarily of their choosing, to safeguard all democracy?

We think it is time for a demonstration of Patriotism.

Think of the lonely serviceman who is shedding his blood on a foreign soil for the preservation of a cause which must seem desperately remote.

Does he have time for protests and debate? He must kill or be killed.

We appeal to all Americans to back the heroic actions of their counterparts in Vietnam. This is not the time for protest; this is the time for allegiance.

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# PROGRESS REPORT

## Fiscal Year 1965

### BUREAU OF YARDS AND DOCKS ★ ★ DEPARTMENT OF THE NAVY

The Bureau of Yards and Docks is responsible for the planning, design, construction and maintenance of the Navy's \$20 billion Shore Establishment which consists of 1000 installations worldwide. Covering 5 million acres, these installations include 100,000 buildings, 10,000 miles of roads, 2,500 miles of railroads, 120 million square yards of airfield pavements, and 800 thousands feet of ship berthing space. To fulfill its "cradle to grave" responsibility for Navy real property, the Bureau annual budget exceeds \$1 billion. In addition to 18,000 civilians, the Bureau/CEC/Seabee "family" consists of 1675 Civil Engineer Corps Officers and 12,000 Seabees.

#### ENGINEERING AND CONSTRUCTION

The results of Bureau engineering and construction during FY 1965 can perhaps be best measured by the value of work put in place: \$375 million. This includes \$103 million completed for non-Navy agencies; principally the Air Force and NASA.

#### Southeast Asia

In Southeast Asia, where the Bureau is the Department of Defense construction agent, design and construction activity increased significantly. During the fiscal year, \$140 million in construction projects were administered by the Bureau field offices in Saigon and Bangkok. By June 1965, the contractor combine had already enlarged its workforce to 12,000 and added nearly \$11 million in equipment to support this workload. Major construction projects in-

cluded airfields, piers, fuel storage depots, ammunition depots, and communications installations.

#### Polaris

The \$12.8 million POLARIS Missile Facility, Pacific, at Bangor, Washington was completed and placed in service in FY 1965. This installation included a 40-ton portal crane designed for loading missiles aboard submarines.

Work continued on Drydock #2 at Norfolk Navy Shipyard which is being deepened to drydock FBM submarines and ships with large sonar domes. When the \$5 million project is completed early in 1966, this drydock, originally built in 1889, will be able to handle ships up to cruisers.

Additional work is progressing on FBM submarine facilities at Charleston, S.C.; Melville, R.I.; New London, Conn.; Pearl Harbor, Hawaii; and Rota, Spain.

#### Other Engineering and Construction

A \$26 million program to restore typhoon damaged Naval facilities on Guam will be completed in October 1965. Work has been completed for the Air Force, Office of Emergency Plans, Government of Guam, NASA and the U.S. Coast Guard.

A \$7 million program for reconstruction or replacement of facilities at Kodiak, Alaska, which were damaged or destroyed by the 1964 earthquake, was 30 percent complete at the end of the fiscal year. Downtown Kodiak, Alaska, which was inundated by tidal waves and continued to be in danger from high tides because of the five-foot subsidence was filled to restore it to its original

elevation. Along with the land fill, the project involved stripping muskeg and placing water and sewer lines and storm drains.

A \$20 million contract was awarded for the final phase of construction of the Navy's VLF communications facility at North West Cape, Australia. This \$70 million facility, which is now 30 percent complete, is still behind planned construction schedules, but intensive efforts to improve progress are under way and it is slated to be finished in December 1966.

Construction of the \$16 million Atlantic Undersea Test and Evaluation Center on Andros Island in the Bahamas continued throughout FY 1965 and is scheduled for completion in March 1966.

Construction is now underway on a \$2 million salvage fuel boiler plant at Norfolk, Va. The first of its kind, the combined steam boiler plant and incinerator which will be fueled by trash and refuse supplemented by oil as required to produce 100,000 pounds of steam per hour. Virtually all trash and refuse generated by the ships and activities in the Sewells Point Area will be disposed of through the salvage fuel boiler. The steam produced will be utilized to service ships berthed in Norfolk.

At Seal Beach, California, \$16 million in Saturn S-II production facilities being constructed for NASA include facilities for assembling the second stage of the Advanced Saturn Launch Vehicle. All construction contracts at Seal Beach are under the cognizance of the Bureau of Yards and Docks.

Nearly \$5.5 million in Air Force

(Continued on Page 8)

construction has been completed on island stations of the Atlantic Missile Range. On Ascension, a 6,700 foot runway was extended to 10,000 feet and work was started on a \$4.5 million tracking station. Construction is also underway or completed on Antigua, Grand Turk, and Grand Bahama islands and at Pretoria, Republic of South Africa.

An Inertial Guidance Test Facility was completed at the Naval Air Development Center, Johnsville, Pa. at a cost of \$1.3 million. The facility is one of the most advanced available for inertial navigation RTD&E.

A master plan for the modernization and expansion of academic and support facilities for the Naval Academy has now been completed and approved. The initial projects in the Master Plan including a new Science Building and Central Heating Plant were submitted to Congress for approval.

A \$2.2 million laboratory built for the Bureau of Commercial Fisheries at La Jolla, California consists of four 3-story concrete units constructed around a central court. Flexibility in utilization of 70,000 square feet of floor space is possible through interchangeable, movable partitions.

Another Bureau of Commercial Fisheries project underway is the Tropical Research Laboratory at Virginia Key, Florida. This \$1 million project is scheduled for completion in October 1965.

The last floating drydock under BUDOCKS cognizance, the ARDM-2, has been converted and was commissioned as the USS ALAMOGORDO. This \$5 million conversion was completed in 13 months.

#### Personnel Support Facilities

During FY 1965 extensive studies directed toward improving Navy barracks and BOQ's were completed. At the end of the fiscal year, final design neared completion on a FY 1966 program for new construction and modernization of barracks for nearly 40,000 spaces costing an estimated \$57 million and for nearly 2,000 BOQ spaces costing an estimated \$7.5 million.

A new concept in barracks design now being implemented calls for one to four man rooms in lieu of open, dormitory-type spaces. This will provide increased privacy and livability.

The Bureau continued to participate actively in the development of Tri-Service criteria and definitive

drawings for personnel support facilities.

The \$29 million rehabilitation of Bancroft Hall, which provides modern, well-lighted and efficiently arranged living spaces for the Naval Academy's 4,000 Midshipmen was completed.

Construction commenced on three major naval hospitals located at Long Beach and Oakland, California; and at Jacksonville, Florida.

#### Family Housing

During FY 1965, the Bureau sought to save \$4.2 million through improved military housing management. Cost reductions achieved in this area actually exceeded \$9 million; more than double the objective.

The average per unit cost of housing operations and maintenance was \$763.52; \$60.00 per unit less than FY 1964. Since 1961, housing operations and maintenance costs have been reduced 7.3%. Funds saved were used to reduce the backlog of essential maintenance which, since FY 1961, has been reduced from \$17.3 million to \$10 million; or about 42%.

Four additional Wherry housing acquisitions brought the total units acquired to 22,378 in 45 projects. These units have been or will be converted to a net of 19,566 units at a cost of \$63.3 million. Navy acquisition of Wherry housing is now complete.

A total of 300 housing units were constructed at Charleston, S. C., under section 810 of the National Housing Act. This act provides guarantees to private builders who construct housing which satisfies Navy standards for Navy occupancy, but involves no expenditure of military construction funds.

During the fiscal year, the Bureau implemented the Navy Family Housing Improvement Plan which calls for the expenditure of \$30 million during the next 5 years to improve existing family housing at 39 state-side and 3 overseas sites.

To improve the quality and reduce the cost of time-consuming redesign of public quarters, the Bureau established a Family Housing Design Review Board to examine Architect-Engineering submissions and provide conceptual guidance for new construction.

In 1965, 7,462 substandard family housing units were removed from the inventory. Since 1958, the inventory of substandard family housing has been reduced by 20,000 units. This has been accomplished through improvement, disposal, demolition and conversion to other uses.

For the fifth year the Navy contracted a portion of its family housing maintenance. Again the quality and quantity of work performed was satisfactory.

A long range program for housing site selection and land use planning has been undertaken which is expected to further expedite placing annual housing construction programs under contract.

During FY 1965, an occupancy rate of 98% was achieved for the Navy's 55,000 public quarters.

#### MAINTENANCE AND OPERATIONS

##### Single Executive Assignment

Chief of the Bureau of Yards and Docks has now assumed complete responsibility as Single Executive for Facilities Maintenance and Utilities Operations for the Naval Shore Establishment. This final phase included assuming overall responsibility for the Navy's transportation equipment.

Resources transferred to the Bureau under this assignment totaled \$331 million in annual operations and maintenance appropriations and \$20.3 million from RDT&E funds. Some 500 separate shore activities are involved in this assignment.

##### Decentralization

The Bureau completed decentralization of middle management for facilities maintenance and operations to its 14 field divisions. Now the Bureau's field divisions receive all maintenance and operations funds for areas. The divisions allot these funds to the base commanding officers and provide guidance on their utilization. Among the benefits derived are improved responsiveness to activity needs, on-site appraisal of requirements, and a greater degree of uniformity in resources distribution and management. Annual funds are made available at the beginning of the year, rather than quarterly. The field activity commanding officer is thus able to plan and schedule workload for the entire year.

##### Utilities

The total cost of utilities operations funded by BuDocks during FY 1965 was approximately \$74 million, including about \$26 million for electrical service; about \$7 million for water and sewage, and about \$41 million for other utilities.

In keeping with Presidential interest in abatement of water and air pollution, the Bureau prepared reports on remedial actions underway

(Continued on Page 9)



at 138 Naval and Marine Corps installations.

The overall cost of telephone service was reduced, and speedier, more flexible, and more efficient telephone service was attained through the installation of five CENTREX (Centralized Group Service) systems in FY1965.

FY 1965 was the second year of operation of the Mobile Utilities Support Equipment (MUSE) Program. During the year, the program was expanded to meet increasing demands for emergency needs and unexpected requirements for electric power generation, steam generation, air conditioning and mobile water conversion (desalination) plants.

The desalination/power generation plant at the Guantanamo Naval Base was placed in full operation in March 1965. The plant consists of three 750,000 gal/day flash type evaporators with a combined output of 2.2 million gallons of fresh water per day at a cost of 97 cents per 10 gallons. Included are 7,500 KW generators and three 120,000 lb/hr steam generators. The plant makes the Guantanamo Naval Base self-sufficient for all present and foreseeable water and power requirements, and is making savings of approximately \$175,000 annually possible.

The first nuclear core refueling of the Navy's Nuclear Power Plant at McMurdo Station in the Antarctic was completed. Since the plant start-up, more than 10 million kilowatt hours have been supplied to the station. A new type of core is expected to reduce future power costs from approximately 5 to 2½ cents per KWH.

#### Maintenance

In October 1964, the Bureau initiated a Maintenance Cost Summary and a Public Works Control Summary for Bureau-funded activities. The Maintenance Cost Summary will provide the management vehicle for the maintenance effort, as it will be used to collect cost data for reporting and computing unit cost rates. Current plans are to extend the cost summaries to Navy Industrial Funded activities during FY 1966.

Engineered Performance Standards (EPS) for maintenance and operations were installed at 10 installations in FY 1965 bringing the total number of activities now using these standards to 105. Two EPS craft hand books were completely revised during the year and modifications made

to five other manuals of the currently available. In addition to the handbooks being used by maintenance activities at Naval installations, the books have been made available to industry through the Defense Supply Agency. In a 10-month period, more than 2,200 books have been purchased by industry.

The Bureau provided the coordinator for, and participated in, the first Department of Defense (DOD) Conference on Real Property Maintenance Management in September 1964. The 116 recommendations proposed at the conference are under study by the DOD Real Property Maintenance Council, and will be the basis of future policy formulations.

#### Transportation

On 1 July 1964, the Bureau assumed management responsibility for specialized transportation equipment, including such items as aircraft refuelers, crash fire trucks, bomb service trucks, crash cranes, and allied equipment.

Some 690 items of transportation equipment valued at approximately \$3.5 million were diverted from the FY 1965 replacement program and shipped to fill requirements in Southeast Asia. Included were buses, trucks, and heavy mobile construction and weight handling equipment. Centralization of this program under a single manager permitted maximum flexibility in fulfilling these needs.

In FY 1965, increased emphasis was placed on accelerated procurement procedures with the result that procurement lead time was reduced by several months. By using computers to consolidate requirements and prepare procurement packages, it is now possible to release a procurement program for 500 items within days compared to the eight months previously required by manual methods.

Costs of maintaining the Navy's administrative motor vehicles declined during Fiscal Year 1965. The cost per mile was reduced from \$.0378 in FY 1964 to \$.0326 in FY 1965. Based on a total of 295 million miles travelled the savings totaled \$1.5 million. The trend of reduced costs is expected to continue in FY 1966 through further improvements in management and fleet modernization.

#### Public Works Consolidations

To increase efficiency and reduce the cost of providing public works services, plans were completed for Public Works Centers at Great Lakes, Ill., Pensacola, Fla., and Yokosuka,

Japan. The Centers serving these Naval complexes were commissioned on 1 July 1965. Prior to these consolidations, each major command operated its own public works department. Savings and improved services will result from better utilization of personnel and equipment.

#### MILITARY READINESS

##### Naval Construction Forces

During FY 1965, units of the Naval Construction Forces were called upon to provide assault and combat construction support for contingency operations in the Dominican Republic and the escalation of U.S. commitments in South Viet Nam. In addition SEABEES participated in large scale Fleet and Fleet Marine Force exercises STEEL PIKE I and SILVER LANCE. The mobility of Naval Construction Forces was enhanced by using airlift for battalion deployments.

##### SEABEES in Dominican Republic and Viet Nam

The Atlantic Fleet Amphibious Construction Battalion supported the landings of Marines and the evacuation of U.S. nationals at Santo Domingo, Dominican Republic. A SEABEE Team, conducting a construction trade school at Santo Domingo, under the auspices of the Agency for International Development, acting upon a request from the U.S. Embassy, during the height of the Dominican crisis, furnished convoy drivers and equipment mechanics and operated the Embassy's emergency power and water supply systems. When the crisis subsided, the Team resumed operation of the school as their Dominican students returned to class.

In May 1965, Pacific Fleet Mobile and Amphibious Construction Battalions participated in an amphibious landing at Chu Lai, South Viet Nam. A Mobile Construction Battalion constructed an 8,000 ft. airstrip on sand for Marine Air Group operations, while elements of an Amphibious Construction Battalion assisted in moving bulk cargo and fuels from ship to shore. Other Pacific Fleet Mobile Construction Battalions were subsequently deployed to Da Nang for the construction of advanced base facilities at that important location.

##### SEABEE Teams

FY 1965 saw SEABEE Teams employed on AID and MAP projects in South Viet Nam, Thailand, Costa Rica, Liberia, Central African Repub-

(Continued on Page 10)

lic, and the Dominican Republic. Also, during FY 1965, select detachments of SEABEES were employed to assure the security of U. S. Embassies, Consulates, and other State Department facilities throughout the world.

The SEABEE teams demonstrated technical and military skills in accomplishing civic action and counter-insurgency projects such as well drilling, flood control, irrigation structures, earthen dams, rural roads, and military fortifications. All projects were slanted to provide on-the-job training for local nationals, exposing them to U. S. equipment, methods and construction know-how. The success of these Teams is measured by the continued requests for their employment by the Ambassadors in the countries where SEABEES have been utilized.

One Team, employed in South Viet Nam building fortifications and a small airstrip for an Army Special Forces unit, was attacked by superior Viet Cong forces. Despite heavy casualties, the Team responded heroically to the attack, resisting the enemy until additional forces and air cover were available for assistance. All members of the Team have been decorated for their actions under enemy fire, including a recommendation for posthumous award of the Congressional Medal of Honor.

#### RESEARCH AND DEVELOPMENT

The total RDT&E budget for FY 1965 was \$5.2 million. Of this total, slightly more than \$4.5 million was allotted to the Naval Civil Engineering Laboratory (NCEL). Emphasis continued throughout the year on deep ocean engineering, construction, maintenance, and facilities operations, as operations research studies related to these requirements.

#### Deep Ocean Engineering

A significant achievement in deep ocean engineering was the recovery and study of 1,318 samples of 301 construction materials which had been submerged in 5,300 feet of water for three years. This effort is considered the nation's major research contribution to date on corrosion and deterioration at great ocean depths.

A deep ocean simulation laboratory was placed in operation. This facility is capable of simulating physical, chemical, and environ-

mental conditions at great ocean depths.

#### Antarctic Research

At McMurdo Station in the Antarctic, a 10,000 foot compacted snow air strip was constructed using techniques and equipment developed by NCEL. The runway successfully supported the 135,000 pound gross load of an LC-130 F aircraft in landing, taxiing, and takeoff. Also, new concepts in ice and snow road construction were developed for use in the Antarctic.

#### Other Accomplishments

Other accomplishments under the research and development program during the year include:

- Construction of an electro-magnetically shielded room with superior characteristics at greatly reduced costs over previous designs.
- Successful fleet tests of inflatable causeways which permit stowage of double the length presently used on LST's.
- Complete fabrication and shallow water testing of an NCEL developed PADLOCK anchor.
- Publication of 140 technical reports and technical notes covering a wide range of studies.

#### REAL PROPERTY MANAGEMENT

In FY 1965, increased emphasis was placed on the management of real property required for military purposes which permits a secondary use. This management program allowed other interests to use more than 180,000 acres of Navy land and 24 million square feet in buildings, structures, and other improved property.

Under this program, expenditures for maintaining the property have been reduced, property values increased by requiring lessees to follow good soil and water conservation practices, and an income has accrued to the Government in excess of \$3.3 million dollars. Navy land has been leased for a variety of purposes including walnut groves at the Naval Weapons Station in Concord, California; orange groves at the Naval Air Station, Sanford, Florida; sugar cane fields at the Naval Ammunition Depot in Oahu, Hawaii; oil and gas wells at the Naval Air Station in Corpus Christi, Texas; and poinsettia fields at the Marine Corps Base, Camp Pendleton, California.

The Naval Ammunition Depot, Charleston, South Carolina won the Navy a runner up position in the Secretary of Defense Conservation

Award program for accomplishments in the Fish and Wildlife Management Program.

Major accomplishments in Fiscal Year 1965 included:

- Acquisition of 550 acres at a cost of \$233,000.
- Acquisition of 13,000 acres by transfer from other government agencies at no cost to the Navy.
- Disposal of 561,000 acres with an acquisition cost in excess of \$109 million. Of this acreage, 516,000 acres were transferred to the Department of Interior in disposal of the Sahwave Gunnery Range, Nevada.
- Reduction in total acreage of approximately 547,500 acres.
- Completion of 70 percent of the graphic portion of a program for preparing an up-to-date graphic and narrative summary of all Navy controlled land. These maps visually depict the legal interests and perimeter descriptions described in various legal documents.
- Extension of management control to over 2 million acres in the Natural Resource program. An income in excess of \$333,000 was gained from timber harvest. Construction and rehabilitation projects for soil and water conservation accounted for the expenditure of \$2.5 million.

#### COST REDUCTION

The Cost Reduction goal of the goal of the Bureau for FY 1965 was \$25 million. As a result of the emphasis on this effort throughout the year, actual savings of \$35 million were reported—142% of the goal.

Savings in Value Engineering, \$6.4 million, and Real Property Management, \$11.6 million, were significant. Substantial savings also were made in Military Housing and Transportation.

SeaBee Veterans of America ----  
On September 26, 1965, Long Island X-1 once again volunteered its services on behalf of A.H.R.C., Association for Help to Retarded Children, at Brookville, Long Island, New York.

Six stout hearted SEABEES, assisted by the brother-in-law of one and the son of another, assembled tree climbing spikes, ropes, saws, axes, truck and an insatiable desire to be of service and tackled a tree felling chore at A.H.R.C. A huge dead tree, adjacent to the main school building, endangered both life and property. As two trees previously were felled by L.I. K-1, so this

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# Environmental Architecture For Military Morale

BY AUSTIN DALY  
DE ROSA & DALY  
ARCHITECTURE-PLANNING-ENGINEERING  
LONG BEACH, CALIFORNIA



A bold solution to the difficult problem of military morale has been given an energetic boost in recent years, from high level of administration. To give the Architect the relative freedom of his mind—to plan, to design, to create a facility that man will respond to—is to in turn give that man a new will and belief in his fellow man.

The primary purpose of the Architect remains, as it has down thru the ages—to design a functionally sound structure that will perform its assigned role with a maximum of efficiency. There is increasing evidence to suggest that the use of form, color, texture in materials, together with the injection of artistic values pays for itself over and over again in elevating spirit and re-enlistment rates.

Among the very sound reasons why the United States Navy and the United States Marine Corps in particular, are giving increased attention to aesthetic values of base structures and recreational facilities is because the average serviceman of today is being exposed to similar values in civilian life—in his home, his place of worship, his school, his neighborhood shopping center, and it is only natural that he desire a continuance of them in his military career.

Appeal to the inherent senses of man, is the order of the day, be it in military or civilian life.

In the course of our work with the Navy, which is reflected in a good many recreational facilities on the West Coast, we have attempted to provide, among other things, a festive, refreshing and exciting atmosphere—one conducive to diversion

and relaxation.

For example, last year, we were retained to plan the remodeling of the Enlisted Men's and Petty Officer's Club at the Long Beach Naval Station. To revive what had become an abortive abuse of space, and inject a new breath of air, became a challenge. The end result is summed up by the overheard words of one sailor, "Never have I seen anything like this in the Navy. Gee, I'll have to bring my wife here for dinner."

Our philosophy is that if we offer military personnel the same surroundings as are available to the off base, they would take a personal pride in the club. They would patronize it accompanied by their wives or girl friends, and as a result, the increased business would permit the club to offer them even more and better service.

Because we did create a family atmosphere, and combined a measure of polish and dignity with a lack of regimentation, the Club has become more and more, a focal point of pride. The personnel use it more often, "head far town" less frequently and in general, realize its benefits to a far greater degree than heretofore.

Our most recent recreational facility is the new Bowling Center at the Naval Air Station, North Island, San Diego. Again environment will play an important part in the overall success of this center. Having designed fifty three bowling centers throughout the country, including the world's largest, a 116 lane house at Willow Grove, Pennsylvania, we have found the response to this great sport highly contributive to MILITARY MORALE.

NAS, North Island, will be the latest thing in military bowling. 24 lanes of Brunswick's latest automatic pinsetters, all color co-ordinated to blend harmoniously with the appointment within. The careful selection of materials, their color, texture, and lasting quality have been given a great deal of thought. One will find beautiful mosaic ceramic tile, and quarry tiles in a wide variety of colors and patterns. The large ornamental iron light fixtures, at the entrance, and hanging in the tall pointed concrete arch inject the enchantment of the Mediterranean, while their warmth is a welcome beacon.

Bowling in the Navy has become a Part-to-Part Sport. A league is formed at say, NAS, North Island. They may end up continuing their league play at Pearl Harbor, Hong Kong, Tokyo, Guam, Sidney or even Mag-Mag. So you see bowling is sort of a portable sport.

If a facility functions with a high degree of efficiency and is aesthetically attuned, the administration will reflect a high degree of pride. For it is only when people are within and respond that our dream begins to breathe.

Our first impressions naturally come from the people we work with, such as at NAS, North Island. It was with great concern for the personnel that **Commander William KEEFE**, Director of Special Services, and **Mr. Nick DRACOLICH**, launched this bowling facility.

The end to it all is the continued good moral and enjoyment of all the personnel, which in turn makes for a high percent of re-enlistment. May we continue to contribute in our small way to this great cause.

(Continued from Page 10)

hazard fell to the buzz of a Seabee saw, the sting of a Seabee axe and the desire of men who care.

In addition to removing a total of 3 huge, dead trees, the members have prepared a complete drainage system around the 20' x 60' swimming pool and poured and finished some 30 yards of concrete so that the unfortunate children might get a very important bit of therapy and pleasure out of the pool.

We know we are not alone in this field. How about reading of the charitable works of other Islands throughout this broad land of ours.

George Ochester,  
Corresponding secretary,  
L.I. X-1

# 1966 FISCAL YEAR CONSTRUCTION PROGRAM

## Southwest Division

### Bureau of Yards and Docks

**REAR ADMIRAL L. C. COXE,**

**CEC-USN**

**Director SW Division**

**Bureau of Yards and Docks**

Lewis Crocker COXE was born in Annapolis, Maryland, on August 19, 1912, son of Captain Lewis COXE, USN (USNA 1901) (deceased), and Mrs. (Lilian M. Crocker) COXE. He at-



Admiral L. C. Coxe CEC/USN

attended high schools in Coronado, California and Washington, D. C., and the Columbia Preparatory School, also in Washington, prior to entering the U. S. Naval Academy, Annapolis, Maryland, on congressional appointment from the State of Texas in 1930. Graduated and commissioned Ensign on May 31, 1934, he transferred to the Civil Engineer Corps of the U. S. Navy, in the rank of Lieutenant (junior grade) on Feb-

(Continued on Page 16)

#### NAVAL STATION, SAN DIEGO

Berthing, Pier 8 .....	\$2,638,000
Water-Fire Protection .....	175,000
Barracks .....	1,097,000
BOQ .....	598,000

#### NAVAL AIR STATION, MIRAMAR

Airfield Lighting .....	290,000
Ground Equipment Maintenance Facility .....	200,000
Administration Building .....	424,000

#### NAVAL AIR STATION, NORTH ISLAND

Electric Distribution Line .....	127,000
Rehabilitate Barracks .....	726,000

#### NAVAL AUXILIARY AIR STATION, REAM FIELD

Barracks/504 Man .....	1,494,000
Mess Hall .....	530,000

#### NAVAL AMPHIBIOUS BASE, CORONADO

Underwater Demolition Unit Facility .....	396,000
---	---------

#### NAVAL TRAINING CENTER, SAN DIEGO

Technical Training Building .....	5,160,000
Recruit Barracks — 1st Increment .....	2,780,000
Service School Barracks .....	2,366,000

#### NAVAL HOSPITAL, SAN DIEGO

Outpatient Clinic .....	1,433,000
-------------------------	-----------

#### FLEET ASW SCHOOL, SAN DIEGO

Barracks — 2nd Increment .....	1,212,000
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#### NAVAL COMMUNICATION STATION, SAN DIEGO

Electric Power System — 2nd Increment .....	221,000
---	---------

#### NAVAL RADIO STATION, IMPERIAL BEACH

.....	300,000
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#### MARINE CORPS AUX. LAND. FIELD, CAMP PENDLETON

Aircraft Direct Fuel Station .....	264,000
Aircraft System Training Bldg. ....	150,000

#### CAMP HORNO, MCB CAMP PENDLETON

Battalion Instruction Bldg. ....	92,000
Battalion Combat Vehicle Maintenance Shops .....	454,000

#### CAMP SAN MATEO

Battalion Combat Vehicle Maintenance Shops .....	236,000
Battalion Supply & Operations Bldg. ....	244,000
Battalion Administration Bldgs. ....	1,167,000
Reg. Administration Bldgs. ....	223,000
Battalion Recreation Bldgs. ....	272,000
Electric Distribution to Ranges .....	43,000

(Continued on Page 15)

<b>DIVISION AREA</b>	
Base Headquarters Bldg. _____	1,334,000
Enlisted Women's Barracks _____	490,000
Gate Facility, San Luis Rey _____	63,000
Base Theater _____	807,000
<b>DEL MAR AREA</b>	
Barracks/Mess 140 Men _____	446,000
BOQ w/Mess 200 Men _____	1,748,000
<b>LAS FLORES AREA</b>	
Outdoor Recreation Facility _____	37,000
Swimming Pool _____	164,000
<b>NAVAL SHIPYARD, LONG BEACH</b>	
Weapons Shop Extension _____	1,950,000
Pump & Valve Repair Facility _____	180,000
Mechanical Calibration Facility _____	125,000
Electric Distribution System _____	499,000
Compressed Air System _____	177,000
<b>NAVAL STATION, LONG BEACH</b>	
Barracks _____	1,035,000
Waves Barracks _____	227,000
Pier Utilities _____	870,000
CO MESS (Closed) _____	187,000
<b>MARINE CORPS AIR STATION, EL TORO</b>	
Airfield Lighting _____	286,000
Survival Equipment Shop _____	222,000
Guided Missile Magazine _____	42,000
Water Distribution System _____	331,000
<b>MARINE CORPS AIR FACILITY, SANTA ANA</b>	
Aircraft Parking Apron _____	809,000
Aircraft Wash Rack _____	92,000
Aircraft Direct Fuel Station _____	792,000
Aircraft Line Buildings _____	161,000
Barracks _____	366,000
Squadron Operations Bldg. _____	263,000
<b>WEAPONS STATION, SEAL BEACH</b>	
Ammo Disposal Facility _____	100,000
Special Weapons Magazine _____	72,000
<b>NAVAL ORDNANCE TEST STATION, PASADENA ANNEX</b>	
Underwater Weapons Laboratory _____	7,998,000
<b>NAVAL AIR FACILITY, EL CENTRO</b>	
Photo Laboratory _____	400,000
Recovery Parachute Test Range _____	2,300,000
Community Center _____	749,000
Rehabilitate Swimming Pool _____	155,000
<b>MARINE CORPS AIR STATION, YUMA</b>	
Aircraft Operations Bldg. _____	300,000
Squadron Supply & Maintenance Bldg. _____	223,000
Road to Target Area _____	96,000
<b>NAVAL ORDNANCE TEST STATION, CHINA LAKE</b>	
LOX Facility _____	47,000
Warhead Research Facility _____	448,000
<b>MARINE CORPS BASE, TWENTYNINE PALMS</b>	
Communication-Electronic School Phase I _____	2,912,000
<b>MARINE CORPS SUPPLY CENTER, BARSTOW</b>	
Heating System _____	200,000

(Continued on Page 16)

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Tele-Comm. Switching Facility .....	241,000
Bachelor Civilian Quarters .....	400,000
Reference Standards Laboratory .....	592,000

**PORT HUENEME**

Public Works Shop .....	266,000
BOQ w/Mess .....	893,000

**OTHER MISCELLANEOUS PROJECTS**

Alter Message Center, NAS NORTH ISLAND .....	127,000
Boat Facility, Naval Amphibious Base, Coronado .....	99,000
Conveyor Overpass, Naval Supply Center, San Diego .....	44,000
Jet Engine Repair Facility, MCAP Santa Ana .....	171,000
DSP Facility, Deep Submergence Group .....	199,000
Addn. to Navy Exchange, NAS Miramar .....	340,000
Exchange Service Station, Naval Sub. Supp. Fac., San Diego .....	32,500
Canopy, Service Station, NTC, San Diego .....	12,000
Rehabilitate USAF Barracks, NAF El Centro .....	63,000
Service Station Facility, Naval Hospital, San Diego .....	37,600
Addition to Bowling Alley, Naval Hosp., San Diego .....	32,500
Alter and Repair Theater, MCAP Santa Ana .....	48,000
Sub. Assembly Bldg., NASA, Seal Beach .....	1,788,000

**HOUSING IMPROVEMENT PROJECTS**

Addn. to Commandant Quarters, Naval Base, San Diego .....	8,000
Community Facilities, Bayview Housing, San Diego .....	30,000
Modernize Bathrooms, Area 2 Public Qtrs., San Diego .....	209,000
Erosion Correction, MCAS El Toro .....	42,000
Increase Electric Service, Santa Ana Housing .....	25,000
Paving Access Roads and Parking, NOTS China Lake .....	81,000
Convert Hot Water System, 76 units, NOTS China Lake .....	200,000
Carpenter Family Housing, MCB Twentynine Palms .....	87,000

**APPROXIMATE SOWESTDOCKS BUDGET FIGURES FOR FY 1966  
SAN DIEGO COUNTY**

	<i>Approx. Amount</i>	
NEW CONSTRUCTION .....	\$30,900,000	including Camp Pendleton
SPECIAL PROJECTS .....	2,000,000	
Architectural and Engineering Services .....	3,000,000	
OPERATION AND MAINTENANCE OF ACTIVITIES IN SAN DIEGO COUNTY .....	21,000,000	
	\$56,900,000	including Camp Pendleton

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ruary 16, 1938, and subsequently advanced in rank, attaining that of Rear Admiral, to date from 1 July 1962.

Following graduation from the Naval Academy in 1934, he joined the USS LEXINGTON as a junior officer. In May, 1936 he was detached for post-graduate instruction in civil engineering at Rensselaer Polytechnic Institute, Troy, New York, from which he received the degrees of Bachelor of Civil Engineering (1938) and Master of Civil Engineering (1939). In June of that year he reported as Assistant to the District Public Works Officer at the Navy Yard, Philadelphia, Pennsylvania, and in July, 1941 became Public Works Officer in the Naval Air Station, Coco Solo, Canal Zone. He was so serving when the United States entered World War II, December 8, 1941.

During the period July, 1942 to September, 1943 he was Resident Officer in Charge of Construction at the U. S. Naval Fuel and Salvage Depot, Hvalfjardur, Iceland, and also had duty in connection with the building of the Army Air Field at Keflavik, Iceland. Completing an assignment in January, 1945 as Officer in Charge of the Advance Base Providing Ground, Davisville, Rhode Island, he next had duty as Officer-in-Charge of the EIGHTY-FIRST Naval Construction Battalion, which took part in the assault and occupation of Okinawa. He continued service with that unit for several months after the cessation of hostilities, and in October, 1945 became Assistant Design Manager, Design Division, Bureau of Yards and Docks, Navy Department, Washington, D.C. When detached from that Bureau in March, 1949, he was serving as Director of the Engineering and Technical Services Division.

Completing an assignment as Public Works Officer at the Long Beach (California) Naval Shipyard in June 1950, he next served as Assistant District Public Works Officer in the Eleventh Naval District, with headquarters in San Diego, California. He remained there until March, 1952, after which he was Officer in Charge of the Public Works Center, Guam, Marianas Islands. In December, 1953 he reported as Public Works Officer, Severn River Naval Command, with headquarters at the

(Continued on Page 17)



Naval Academy, Annapolis, Maryland, and in August, 1957 returned to the Bureau of Yards and Docks to serve as Executive Assistant to the Assistant Chief of the Bureau for Construction, and later as Assistant Chief for Planning and Design.

In May, 1960 he reported as Area Public Works Officer, Eastern Atlantic and Mediterranean (later redesignated Director, European-Mid East Division, Bureau of Yards and Docks), with headquarters in London, England. In July, 1962 he reported to the Yards and Docks as Inspector General and Assistant Chief for Administration. On July 12, 1963, he reported to the Commandant, Eleventh Naval District, as Director, Southwest Division, Bureau of Yards and Docks, and District Civil Engineer.

Rear Admiral Cox has the American Defense Service Medal; American Campaign Medal; European-African-Middle Eastern Campaign Medal; Asiatic - Pacific Campaign Medal; World War II Victory Medal; and the National Defense Service Medal.

**Achievements and awards:**

Tau Beta Pi Honorary Society; Sigma Xi Scientific Society; Fellow, American Society of Civil Engineers; Society of American Military Engineers; Registered Professional Engineer (Civil and Structural); and listed in "Who's Who in Engineering."

**SEABEES SOLVE STICKY PROBLEM FAST**

Three ingenious and over-fed Seabees in Viet Nam are looking for another ice cream freezer to repair.

The dasher-licking bonanza began for UT2 R. G. Fischel and CEPCN R. L. Scott, both of Naval Mobile Battalion Three, when a crestfallen Marine approached and asked if they could fix his ice cream freezer.

Shaking their heads over the "difficulties" involved, the Seabees retired to their DaNang camp where they consulted with UT2 R. E. White who made the repairs within minutes.

Continuously stalling the Marine with vague promises, the Seabees ran through all the ice cream ingredients in their camp and then turned to borrowing supplies from the Marine and his friends to "test" the machine.

After three weeks, the machine was returned to the Marine, who was

delighted with the repair job.

But the Marine has a secret, too. Try as they will, the Seabees couldn't get him to tell them where or how he got the precious ice cream freezer in the first place.

**SEABEE TEAM AID LIBERIANS**

The Seabees have carved out another large portion of good-will for the United States by building two heavy repair shops and constructing roads in Liberia.

Seabee Team 7-2, under technical direction of the Navy's Bureau of Yards and Docks, erected the shops at Wainsue and Tappita. Each shop contains 3,840 square feet of work space and offices.

The team used the construction projects as a basis for teaching Liberians equipment operation and heavy duty mechanics.

The most notable road project was construction of a 15-mile farm-to-market stretch from Foya Kemala in northwest Liberia to the Sierra Leona border.

The team worked in cooperation with the Department of Public Works of Liberia and the United States Agency for International Development.

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## BUREAU OF YARDS AND DOCKS

### CONSTRUCTION PROGRAM IN VIETNAM

As construction Agent in Southeast Asia for the Department of Defense, Navy's Bureau of Yards and Docks has been responsible for the completion of more than \$150 million in military construction in South Vietnam and, upon completion of work assigned, will have completed an additional \$150 million in construction projects.

Coordinating and directing this program is **Rear Admiral William M. HEAMAN**. His staff of 30 Navy Civil Engineer Corps officers and 150 Bureau and contract civilian engineers are dispersed at construction sites throughout the country.

The major portion of construction in Vietnam is under a cost plus fixed fee contract by a joint venture consisting of **Raymond International, Morrison-Knudsen, Brown and Root and J. A. Jones**. All are American construction firms.

Except for strikes flown from carriers off Vietnam, practically all air strikes are being flown from airfields built or rebuilt by the contractor.

Presently major construction is underway at fourteen principal locations from Da Nang and Phu Bai in the North to Soc Trang in the Delta area, with projects of lesser size in progress at scores of added sites.

The master plan for Da Nang including the adjoining East Da Nang complex calls for a 10,000-foot concrete and asphalt runway at the main air base which is already operational, a POL tank farm with an off-shore unloading fuel line, perimeter security locations, two deep draft piers and a storage area. To relieve the congestion at the main air base, a parallel 10,000-foot runway is under construction. A \$5 million aircraft control and warning facility on an adjacent mountain top has been completed. Support facilities constructed or under construction at Da Nang include cantonments to house military storage areas, and warehousing.

To further relieve the congestion at the main Da Nang airfield an additional air facility, chiefly for helicopters, has been constructed at Da Nang East which is separated from the main air base by the Tourane River. Called Marble Mountain Air Facility, it has a 2,000-foot pierced steel plank (PSP) runway and a

135,000 square yard PSP parking apron. These facilities were constructed by the contractor in 90 days. Construction of a 400-bed advanced base type hospital there is progressing. This complex was damaged during the October 27th attack by the Viet Cong.

Developing facilities through which supplies and equipment can be funneled into Vietnam continues to be a challenging problem. To alleviate this problem, Cam Ranh Bay is being developed into major advanced base type, deep water port. A 600-foot concrete pier built there by the contractor can accommodate two ships at a time.

A few miles North of the port, the Cam Ranh air field is being rushed to completion by contractor forces. Here, a 10,000-foot AM-2 aluminum mat runway was completed and operational in 70 days. A parallel taxiway has been completed and a parking apron is nearing completion. Support facilities adjacent to the parking apron and a cantonment for Air Force personnel have also been completed.

Construction of the field involved the moving of more than 1.3 million cubic meters of sand and placing of more than two million square feet of aluminum mat and 1 million square feet of PSP.

Other evidence of construction in support of U. S. commitments in Vietnam are the airfield complexes at Chu Lai, Nha Trang, Bien Hoa, Can Tho, and Pleiku.

Planned as a temporary advanced base facility, Chu Lai has an 8,000-foot plank runway and taxiway which was built by the Navy's Construction Forces — the Seabees. Using arresting gear for the landing and rocket assist for takeoffs, Marine Corps aircraft were able to fly off the runway in 30 days when it reached a length of 3,500 feet. A 10,000-foot concrete runway is now under construction at Chu Lai.

Additionally, ramps being constructed at Chu Lai will enable LST's to discharge supplies and equipment directly onto the beach. In the past, supplies were brought ashore over a 1,200-foot pontoon causeway which jutted out into the South China Sea. This causeway, which filled its purpose, is beginning to break up as a

result of buffeting by heavy surf during the monsoon season.

At Qui Nhon facilities have been rehabilitated under the Military Assistance Program. The runway has been repaved and other facilities constructed to increase the airfield's overall operational capability.

The same is true for the Nha Trang airfield, except some construction funds were provided through the Air Force Military Construction Program.

Located in the central highlands of South Vietnam, the Pleiku air facility was completely built by the contractor utilizing equipment borrowed from the government of Vietnam for initial earthmoving. The runway, first built with pierced steel plank, has since been paved with asphaltic concrete.

At Can Tho, the principal city in the Vietnam Delta, some 100 miles southwest of Saigon, work commenced on a 6,000-foot asphalt runway, parallel taxiways, a parking apron and support facilities in early 1964. The field was operational in October two months ahead of schedule.

Here, the contractor was faced with a flooding problem, compounded by a soil condition. The soil consisted of a silty clay intermixed with decayed organic matter extending to a depth of 100 feet. The airfield was built by utilizing a system of peripheral dikes and controlled drainage canals within a 3-foot blanket of free-draining sand placed on top of the natural soil forming the sub-base for the runway.

Sand was pumped from a submerged stratum in the middle of the Bassac River. Quarry operations were performed by Vietnamese subcontractors. The crushing operation was interesting in that rock for the base course had to be carried from its source some 40 miles away. The material was handled eight times, including a sampan trip down the river from the quarry operation through placement.

The airbase at Bien Hoa, construction of which was started in 1962, was the first newly constructed major jet airfield completed in South Vietnam. Built by the contractor under the Military Assistance Program, it was operational in 1963. Bien Hoa has a 10,000-foot concrete runway with a parallel taxiway, a helicopter apron, and logistic and personnel support facilities.

Prior to the completion of the airbase at Bien Hoa, jet aircraft could only operate from Tan Son Nhut air-

(Continued on Page 27)



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The *J.A. Jones Construction Company* and its affiliated organizations have served owners on a wide variety of projects in every field of construction, both here in America and many foreign countries. The *Jones Company*, founded in 1894 has always welcomed and met the challenge of difficult and unusual projects with a highly skilled managerial and technical staff, modern engineering techniques and the best construction equipment available.

*J.A. Jones'* reputation for integrity, quality of work and speed of construction is unsurpassed. As a recognized leader in pre-fabrication, form design and accident prevention, the company has consistently achieved a reduction in costs for its clients. The *Jones Company* has been awarded the nation's top safety honors by the Associated General Contractors of America, Atomic Energy Commission, National Safety Council and the U.S. Army Corps of Engineers.

In addition to industrial plants, high-rise buildings, institutional and government buildings, dams, powerhouses, locks, port facilities and highways, the JONES COMPANY has made a major contribution to the defense effort with these recent projects:

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Sondrestrom Air Force Base, Greenland  
Harmon Air Force Base, Newfoundland  
Titan II Missile Launching Facilities  
DYE Early Warning Sites, Greenland  
RMK-BRJ Projects, South Vietnam  
Military Base Construction, Iran  
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# CALIFORNIA WATER PROJECT

## AWARD TO BURNS AND ROE

Mr. Kenneth A. ROE, President of Burns Roe, Inc., announced recently that his Company was advised by Mr. William E. WARNE, Director of the California Department of Water Resources, of the acceptance of a proposal by a group of three firms with specialized skills to assist the State Department of Water Resources in establishing "a superior and sophisticated system" of operations and maintenance for the State Water Project.



Burns and Roe, Inc., Los Angeles engineering firm, in association with North American Aviation, Inc., and Price Waterhouse & Company, submitted the proposal which was chosen in competition with five others received by the Department in response to invitations issued to twenty firms.

Warne said the Department has the nucleus of an operations and maintenance group, but that the strength of this force must be increased from 60 now to about 900 by 1972.

"We believe the selected firms have broad experience and special skills which can make an important contribution to the Department in developing a superior and sophisticated system for operations and maintenance," Warne said.

"The Burns and Roe team will assist with the development of operations and maintenance procedures and manuals, as well as with personnel training and other aspects of the support and control of water and power operations.

"We who will operate the State Water Project have a unique problem to solve. Our 444-mile long California Aqueduct, most of it open canal, will be operated on an ever-

full basis. This is similar to a local system of piping in residential areas. When the housewife turns on the water, the pipe fills behind the faucet.

"The Department is using the California Aqueduct itself as a balancing reservoir. As a water agency draws water, we will maintain the canals ever-full. To operate this open system as if it were a pipe will require the ingenuity of experts.

"The operations and maintenance consultants we have now chosen under the direction of Burns and Roe, together with others who are developing programs for the automation of the Aqueduct, will solve this problem and will provide us with the most efficient and economical water delivery system."

Warne said the State Department of Water Resources called in top people, in line with the program of Governor Edmund G. BROWN to expand the use of this unique resource by California government, management and engineering firms.

"They responded with excellent offers," Warne said. "The biggest problem has been the selection of the best proposal.

"California is fortunate to be the home of a large number of engineering, aerospace, and industrial management firms with broad experience and special skills which can be of value to the State in keeping government in the orbit of advanced technology."

Warne said the Burns and Roe consulting team will start work before January and will complete the assignment in mid-1967. Fee for the services will be negotiated.

"By employing a qualified and highly specialized contractor to assist with the peak workload which we have in the period just ahead, the Department will be able to build up our own operations and maintenance organization in an orderly manner," Warne said. "This arrangement will make a substantial contribution toward the readiness of the Department to deliver water on schedule as construction is completed."

Seventy percent of California's water supply originates in the northern third of the state. Seventy-seven percent of the water need lies in the southern two-thirds.

This simple fact, coupled with a growing population that has put California first among the nation's states, has given rise to one of the most imaginative engineering developments in the history of man—the State Water Project.

California themselves decided to go ahead with the plan at an election in November, 1960, when they voted \$1.75 billion in bonds to finance the distribution of water from areas of surplus to areas of need.

The results of that decision are apparent throughout the State. The first water deliveries under the project are being made through the South Bay Aqueduct into the Livermore Valley in Alameda County. Work is under way on Oroville Dam, key



unit of the project, and on the California Aqueduct, the 444-mile-long manmade river that will take water into Central and Southern California.

Water that would otherwise flow uselessly into the ocean will be pumped from the Sacramento-San Joaquin Delta, through valleys and over mountain ranges, to serve populous cities such as Los Angeles and Santa Barbara, as well as the burgeoning suburbs in counties ranging from Napa on the north to San Diego on the south.

First deliveries of water into Castaic Reservoir, Los Angeles County, and into Perris Reservoir, Riverside County, are planned for 1971 and 1972.

A key unit of the project, Oroville, linked forever with the romantic past of California's gold era, now has an even more far-reaching link with the state's dynamic future — Oroville Dam.

It will be the key unit of the State Water Project. It will be a multiple purpose dam, providing Californians at one and the same time with water conservation, flood control, electric power and recreation.

Water from its 3.5 million acre-foot reservoir will replenish the supply of the Sacramento-San Joaquin Delta, natural pool of waters to be transported to areas of need. Surplus Feather River water flow into the Delta and then throughout the project, assuring a bright future of "White Gold" for the Golden State.

# CLAY BRICK MASONRY ITS ADVANTAGES

by  
**Hugh C. MacDonald,**  
Executive Director  
Associated Brick Manufacturers  
of Southern California

The selection of a building material to solve an architectural design problem involves esthetic, engineering and economic criteria. Frequently, certain of these criteria may be predetermined. The building must harmonize with the existing plant. The initial cost cannot exceed a stated figure and of course the building code has to be met. Aside from these initial restrictions, the problem is to select a type of construction which fulfills the esthetic and engineering functions at the least ultimate cost.

To select a type of wall construction, the designer should first impose rational criteria in each of these fields. What color and texture best expresses the architectural concept? What fire resistance is required? What noise levels can be tolerated? What useful life expectancy is necessary? How much heat gain can be tolerated from the economic and comfort points of view? Having established logical criteria, the designer should then make a selection of materials and methods to meet those requirements.

Good workmanship, proper design and the selection of the right material are the first steps in the solution of future maintenance problems. If the proper grade and type of brick is selected, maintenance costs can be materially reduced. This is true in an esthetic sense as well as structural. For example in a locality free of smoke and soot, clay masonry units of any color or texture may be used. In highly industrialized areas however, a smooth textured, dark colored unit, with low absorption, will permit rain to wash the wall clean and thus help reduce maintenance costs. If the wall is properly constructed and structurally sound, it can be expected to require little maintenance over a period of many years. It is our intent here to describe the esthetic properties of clay masonry walls, which involve color, texture pattern and form. The esthetic tools available to the designer using clay masonry are here

reduced to their essentials.

## UNIT COLOR

Natural color structural clay products are produced in a wide range from the pure tones of pearl grays or creams, through buff, golden and bronze tints, to a descending scale of reds, down to purple, maroon and gunmetal black.



Dutch white Norman brick laid in stack bond with raked joints.

The chemical composition, including any chemicals which may be mixed with the natural clay, and the degree and method of burning control the color of the finished clay product in the absence of applied coating, such as glazes or non-lustrous finishes or the introduction into the kiln of chemicals which vaporize and combine with the clays to produce color effects such as are obtained in salt glazing or zinc flashing.

Iron has probably the greatest effect on color of any of the oxides or fluxes commonly found in clays. All clay, regardless of its color, containing iron in practically any form will burn red if exposed to an oxidizing fire. The compound producing the color is ferrous oxide which results from the decomposition of ferrous silicate under oxidizing conditions. This same clay, if burned in a reducing atmosphere, will take on a purple cast due to its ferrous silicate content.

For the same raw materials and

methods of manufacture, the darker colors are associated with harder burning which also tends to decrease water absorption and increase compressive strength. However, due to the influence of chemical composition on color, there is obviously no relation between strength and color or between water absorption and color that can be applied to products produced from different raw materials.

Since the natural colors of clay products are, with few exceptions, mixtures of shades, rather than pure colors, the accepted practice in specifying color is to require the shipment to match an approved sample.

## TEXTURE

Texture is the surface effect or appearance of the unit apart from its color. The degree of texture ranges from fine through medium to coarse. The principal textures are smooth, matt face with vertical or horizontal markings, rugs, barks, scored, stippled, sandmold, waterstruck and sandstruck.

Texture may also be introduced into the wall by utilizing various



Norman face brick with ruffled texture in one-third bond using a raked joint.

types of mortar joints. The accompanying illustration shows six types of joints in common use. These are:

1. Concave Joint
2. V Joint
3. Weathered Joint
4. Flush Joint
5. Struck Joint
6. Raked Joint

Tooled joints, Nos. 1, 2 and 6, which compress the mortar tightly against the masonry units produce the best resistance to rain penetration.

(Continued on Page 61)



# Port Hueneme

In the late 1930's the farmers of Ventura County faced a problem which had grown more serious through the years; the marketing of their products. Cost for the haul from the Oxnard plains to Los Angeles by truck and rail was becoming prohibitive. A dream of the early settlers in this area had long been to build a harbor. Seeing this a possible solution to their problem, they were given added incentive. The farmers created a "harbor district" out of 1,600 acres, voted a bond issue of \$1,750,000 and completed the harbor of Port Hueneme on 6 July 1940.

With the attack on Pearl Harbor and our entry into World War II, we found immediate need for an advanced based depot on the West Coast. The Navy decided that Port Hueneme with the excellent harbor and level terrain, provided the ideal location. On 12 March 1942 the Navy began constructing its new base with an emphasis on handling and training Seabees and using the harbor to the fullest extent.

During the course of the war, Port Hueneme trained over 50,000 personnel and shipped out more Navy war tonnage, supplies and equipment than any other facility on the West Coast.

At the end of the war, it was decided to keep the \$39 million facility by incorporating into it a number of other activities. Today, with the U.S. Navy Commissary Store as the major component activity, there are 15 major tenant commands within the

U. S. Naval Schools, Construction known as the "Seabee college", (NAVSCON) is the only school of its type in the country. All Pacific and Atlantic Seabees receive their schooling here in basic, advanced and special courses of instruction. Over 100 special fleet courses are set up for training of homeported Seabee personnel. New classes are added as required and an average number of graduates each year is 6,000. This includes Seabees, Air Force and Marine personnel, reserve personnel, and students from foreign friendly nations. The Schools are under the direction of a Commanding Officer.

U. S. Naval School, Civil Engineer Corps Officer—this school graduates an average of 600 new Civil Engineer Corps officers, reserve service

personnel, and civilians from Department of Defense and other government agencies each year. In addition to its basic class, nine other courses varying in length from two to eight weeks in subjects such as disaster operations and engineering are taught. Upon completion of its nuclear defense construction course, a certificate as a fallout shelter analyst is issued by the OCD. The school is under direction of an Officer in Charge. CECOS was transferred to Port Hueneme from Davisville, Rhode Island in September 1946.

U. S. Naval Civil Engineering Laboratory—This activity is also the only one of its type in the United States. Its mission is naval research, testing, evaluation and development. It also undertakes many projects for other armed services and defense agencies. The laboratory is embarked on a project for the U. S. Antarctic Research Program in designing a permanent scientific station at the South Pole and has continuing programs connected with sea ice and snow compaction construction, studying methods of designing personnel shelters to provide effective shielding against nuclear radiation, and has begun research into the deep-ocean effects on construction and other materials seeking problems probably to be encountered in constructing and maintaining structures on the ocean floor. The Laboratory is under the command of a Commanding Officer/Director. It was transferred from Solomons Island, Maryland to Port Hueneme in 1950.

Another major tenant command is the Construction Battalion Base Unit, direct representative of the Commander, U. S. Naval Mobile Construction Battalions, U. S. Pacific Fleet, headquartered in Pearl Harbor, Hawaii. CBBU is responsible for technical and military training of the Pacific Construction Battalions which is given at the Center, the Naval Schools Construction and the Marine Corps Base, Camp Pendleton. CBBU is under control of an Officer in Charge.

Navy Finance Office—this activity under an Officer in Charge, is designated to maintain accounts of and make payments to personnel of naval activities served; pay civilian payrolls; prepare and pay military and civilian travel claims; maintain

accounts for and issue U. S. Savings Bonds; receive miscellaneous cash collections; and perform such other functions as assigned by the Comptroller of the Navy.

Home of the Pacific Seabees—Port Hueneme, besides serving as home port for the five Pacific Mobile Construction Battalions Three, Five, Nine, Ten and Eleven, also berths four MSTs Ships, and facilities for NAS Pt. Mugu Surface Craft Department.

Commissioned 8 July 1963, a new tenant activity became established on the Center—the U. S. Naval Ship Missile Systems Engineering Station, under the management control of the Bureau of Naval Weapons. The station's mission is to provide technical and engineering assistance to the Special Navy Task Force for Surface Missile Systems. Initial staffing of the station was 250, but it is now approaching 1,000, with further growth anticipated. The station is under the control of a Commanding Officer/Director. NSMSES is housed in the spaces previously used by the Yards and Docks Supply Office which disestablished 1 July 1963.

Two other major tenant activities at CBC are the USMCR Training Center and the PMR Field Engineer Office.

Although the Center's responsibilities are numerous and include among other services, disaster recovery facilities and training for military and civilian elements of the fleet and shore establishments, the primary mission is full support for the Pacific Mobile Construction Battalions deployed from Guam to Alaska, and in Southeast Asia.

CBC also provides facilities and logistic support to U. S. Marine Corps/U. S. Navy amphibious forces for the assembly, staging, outloading, and back-haul of personnel and equipment engaged in southern California training exercises.

Tidewater terminal shipping facilities are provided for U. S. Marine Corps Supply Depot, Barstow, in support of U. S. Marines in the Pacific Ocean area.

Facilities are also provided with the outloading of Marine Air Wing elements under emergency conditions, as well as training for Reserve Mobile Construction Battalions.

The Seabee Center, bordered on one side by the sea and on the other by the Oxnard plains, enjoys moderate weather. Metropolitan Los Angeles is 50 miles to the south and scenic Santa Barbara is 40 miles to the north. The nearby com-

(Continued on Page 59)

# THE 'NEW LOOK' IN MILITARY HOUSING

By ELAINE K. SEWELL

Military housing is taking on the "new look" throughout the country with emphasis on good design, durability in terms of construction materials and concern for the environment in the new family projects.

In past years, military housing varied in quality from one location to another, depending upon a number of variables. In some instances, the government had to fill emergency needs from emergency appropriations for housing that was needed immediately. Despite the attempt to maintain some of these housing projects properly, the present-day appearance is not attractive to military families. There is a characteristic look of bleakness and drabness in most of this emergency housing. The design quality is not up to minimum standards for family housing either in terms of environment or relationship of spaces inside the various units. At the same time, the cost of these projects is such that the quality of construction of the housing could be better for the same output of government expenditure. In other words, somewhere along the way, the government was getting a broad range of results for approximately the same amount of money for its housing dollars.

To avoid poor investments in the future which result from lack of advance planning or absence of adequate design standards, the Department of Defense worked with four architectural firms in various parts of the United States to develop criteria for military housing and to recommend minimum standards. The intention was not to design "stand-

ard" housing units or to set arbitrary and rigid design standards. Rather, the intention was to establish the kind of criteria which all architects would respect and incorporate in their housing designs.

A forward step in the total picture of military housing is the government's concern for the site planning as well as individual housing units. Since the late 1800's, planners have talked about advantages of good community planning, the importance of "greenbelts" that provide traffic-free areas within housing projects and the ability to develop better living experiences when the master plan for a housing development shows concern for the total picture of houses, sidewalks, streets, playground areas, etc.

The problem in a general sense, however, has been that most city, regional and state government entities which control the building code and zoning regulations have developed such rigid restrictions that few developers in non-military housing have the opportunity of looking at the total picture when they plan a particular piece of property. In addition, in most parts of the country, large chunks of raw land are becoming increasingly rare. What land is available to the developer today comes at a premium cost. With such restrictions on land use, scarcity of land and high land values, the independent developer has difficulty in arriving at the best possible solutions for his land. By contrast, military housing provides opportunities for development of its family housing projects with greater freedom of design than the independent developer finds possible in non-military housing. Following are some of the major objectives of site planning, which the architectural firm of A. Quincy Jones, F.A.I.A., and Frederick E. Emmons, A.I.A., Los Angeles, set forth in their portion of the design folio which the department of defense prepared for military housing:

1. Provide maximum separation of pedestrians from vehicular traffic, both within the housing area, from unit to unit, and between the housing area and related base facilities.
2. Eliminate automotive traffic from movement within housing development wherever possible, and facilitate vehicular traffic by designing a loop road for site and using culs-de-sac when feasible.
3. Develop a grouping of living units with no more than

twenty families occupying one cluster, to achieve individuality and identification.

4. Group the several buildings in each cluster to relate to certain common facilities (such as trash storage facilities, car parking, etc.)
5. Provide space in motor court for residents' cars, and locate the cars as near to respective living units as feasible, screening the area with plant materials to minimize the visual impact of the parked cars.
6. Encourage the increased use of related indoor and outdoor spaces by including essential privacy screening by means of plant materials or fences.
7. Provide greenbelts and recreational areas common to the various housing clusters.

These criteria are not new or unusual but they provide a basis for planning the site in such a way that the families within the project may take maximum advantage of the opportunities to enjoy their living experiences. By contrast, in many independent or non-military housing communities of the same number of families, few of these amenities exist. Many times, restrictions prevent execution of these concepts in private housing.

The grouping of living units in clusters permits development of greenbelts without increasing the amount of land or density of population. Military housing has an advantage in planning because the property may be considered as a total site to develop. In most instances, the independent builder does not have the opportunity to develop a planned community with the same amount of freedom.

The government's increased concern for the well-being of the man and his family is reflective of other social changes taking place in the country as well as in the military. By recognizing that the man can serve better if he knows his family is well-housed and if he, himself, has a good place to go when he finishes work at the base, the government is committing its housing dollars to more than the construction of mere shelter. By working with imaginative architects who have been involved during the past twenty years in the serious effort of trying to improve housing in the low-cost fields, especially, the government

(Continued on Page 27)

(Continued from Page 26)

shows its awareness of the important factor of housing in the overall military picture.

Gradually, the architects are able to demonstrate that "good design" in itself results from application of sound principles, not from increased budgets alone and that, given the opportunity, they can produce good communities for the same amount of money that often goes into emergency housing where little thought is focused on planning or design.

In the "new" military housing, the objective is to furnish the military personnel with housing units designed to accommodate the maximum flexibility in their adaptation to family living patterns. There is usually enough open space and relationship of indoor and outdoor spaces that families may eat in the patio as well as inside the house, for instance. Living courts, or patios, are provided with many of the new housing units. If the military screens these areas, the courts serve for play area for children as well as privacy spaces for adults.

During the next few years the military will continue to build consider-

able housing, according to present forecasts.

Hopefully, the present attitudes which consider military housing as a vital part of the total effort of the department of defense will prevail. Every effort should be made to continue working with imaginative architects in all parts of the country who will improve continuously the design of family housing units and the planning of the family housing projects.

Every effort should be made to instill in the construction industry the same objectives of responsible concern for building the best possible units for the government. It should be clear to everyone that the government's housing projects should provide the best possible examples of good design and high quality of construction.

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#### Viet Nam Construction

part at Saigon.

On the river front at Saigon, work is underway on the construction of

a quonset hut storage complex that will provide approximately 200,000 square feet of covered storage area. To the rear of the complex, a fill area will provide land for cantonment facilities for 2,400 men.

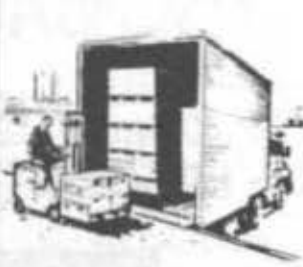
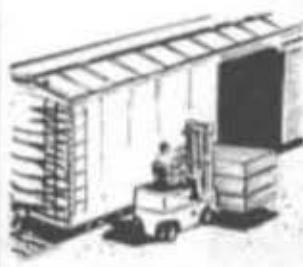
Also, a 500-foot quay wall is being constructed which will provide deep draft along-side berthing for two ships. This will help to alleviate the difficult ship unloading situation that currently exists in Saigon.

To illustrate the vast scope of the construction program in South Vietnam: the contractor now employs more than 24,000 workmen; he has over-26 million worth of construction equipment employed in-country; and construction material is flowing out of West Coast ports at a rate measured in millions of dollars worth each week. The construction rate in-country is also measured in millions of dollars per week.

During the week ending October 3, \$12 million in equipment and material orders were placed within the continental United States and 77,000 measured tons of cargo were shipped from West Coast ports.

It is estimated that \$20 million is flowing through the contractor's logistic pipeline per month in support of U. S. construction commitments in South Vietnam.

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## REAR ADMIRAL LEWIS B. COMBS, CEC-USN, Retired

It is a well-established fact that more CEC officers get their engineering degrees from Rensselaer Polytechnic In-



stitute than any other engineer school. Of the many graduates of that institution who have served in the Corps, Rear Admiral Lewis Barton COMBS is

the most closely affiliated. He was graduated from RPI in 1916; received an honorary Doctor of Engineering from the Institute in 1946; and upon retiring from the Navy at the end of 1947 became Head of its Civil Engineering Department.

Born on 7 April 1895 at Manchester Center, Vermont, RADM Combs was commissioned in the CEC in December 1917. From 1919 to 1924 he served as one of the Treaty Engineers in the Republic of Haiti. From 1932 to 1935 he had duty as Public Works Officer in the NINTH Naval District and from 1935 to 1937 in the SIXTEENTH (Philippines).

He reported to BuDocks in 1937 and was assigned as Officer in Charge of Construction at the Naval Experimental Model Basin, Carderock, Maryland. A commander at that time, he was selected in January 1938 to serve as Assistant (Deputy) Chief of the Bureau under Admiral Moreell.

Rear Admiral Combs served nine years in this post; longer than any other officer. For skillfully supervising

the complex internal administrative functions of the rapidly expanding Bureau and for other noteworthy accomplishments during World War II, he was awarded the Distinguished Service Medal.

In 1942 he was promoted to rear admiral, marking the first time that Bureau Deputy Chief held this rank.

In March 1946 RADM Combs became Director of the Atlantic Division of BuDocks with headquarters in New York City. He served in this post until his retirement in December 1947. Although only 51, he had completed 30 years of service in the Corps.

RADM Combs holds Life Membership Card #10 in the Seabee Veterans of America, and maintains his residence in Troy, New York.



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# Cracking of Cement Basecoats with Smooth Trowel Finish Study Subject

By Clyde Bell

Coincident with the increased use of plastic and gun-plastic cement, there appears to have been an increase in the severity and frequency of cracking in portland cement plaster basecoats, after application of smooth trowelled finishes.

It cannot be denied that some plastering contractors, while viewing with some trepidation the specifying of interior smooth-trowelled portland cement plaster, do not normally experience serious failures with their methods of applying such plaster.

Cracks in smooth portland cement plaster, due to normal shrinkage, can usually be spackled before painting (if the surface is to be painted). Severe cracking, accompanied by distortion of the finish plane (a bulging out) at the cracks, can generally only be corrected by (a) grinding and patching or (b) overcoating the entire surface. Removal of the entire plaster membrane has occasionally been required by the architect but in this writer's opinion, such a corrective measure is not the answer, if the plaster is not of adequate strength. However, this article is not concerned with correction, which even under the best circumstances is costly and time consuming. We are primarily concerned with prevention.

There is evidence to support the theory that lack of correlation between proportions, strength, and shrinkage characteristics of (a) basecoat plaster (scratch and brown) and (b) finish plaster, does materially contribute to the severity and incidence of failures of smooth-trowelled portland cement interior plaster.

An imbalance in the tensile forces between two faces of a laminated material will cause movement towards the face with the greater tensile force.

When the coefficient of contraction (shrinkage) of a finish plaster (if stronger than the basecoat plaster to which it is applied) is greater at the finish plaster surface than is the shrinkage of the basecoat, deformation of the entire plaster membrane

will occur at any cracks which occur during the shrinkage cycle.

Compressive and shrinkage tests performed by Smith-Emery Company on various portland cement plaster mixes for the Western Conference of Lathing & Plastering Institutes contribute evidence to support this theory.

In these tests three separate cementitious material combinations—(a) Standard (common) cement plus 10lbs. of hydrated lime, (b) one-half Standard and one-half Plastic Cement (c) Plastic Cement—were individually combined with 2, 3, 4 and 5 parts of plaster sand by weight, and then combined with water to cast cubes for compression test, tension briquets and shrinkage bars.

The following criteria were used in preparing specimens:

1. All proportions by weight.
2. Sufficient water to produce a 2-inch slump using 2x4x6-inch slump cone.
3. All specimens cured in air at 50%  $\pm$  8% relative humidity and 70  $\pm$  5 deg. temperature. (These criteria are not normal criteria for preparation of test specimens. However, it was felt that they would more nearly approximate the conditions obtained on the site of a project, thus possibly affording some information which could be related to job failures).
4. Readings were made at 1, 3, 7, 14 and 28 days.

Table A shows the average 28-day compressive strength readings reported on twelve basecoat and four finish coat mortars.

Table B shows the average 28-day shrinkage readings (stated in ten-thousandths of an inch for a ten-inch long shrinkage bar) for the same mixes shown in Table A.

While tensile strength tests were made, they are not reported at this time, since I do not feel they would produce any usable data towards solution of the problem.

**Both tables clearly demonstrate that it is entirely possible under currently acceptable practice, to apply a 4000 psi finish plaster to a 700 psi basecoat plaster.**

It is this writer's belief that this lack of realization of the different shrinkage and strength characteristics

Table A—28-DAY COMPRESSIVE STRENGTHS  
Portland Cement Plaster Mixes

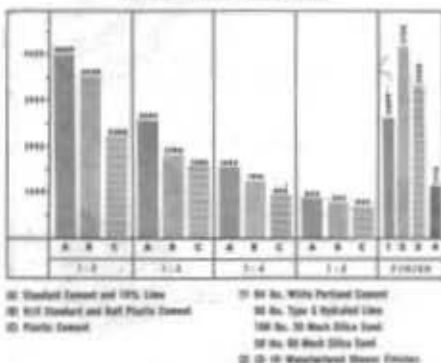
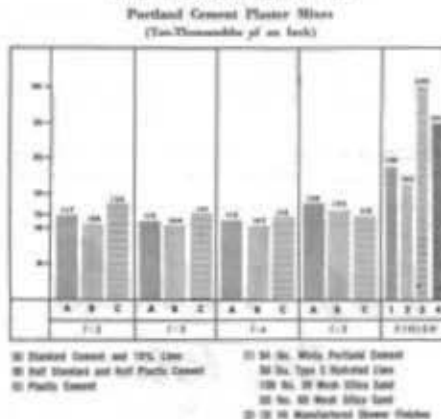


Table B—28-DAY SHRINKAGE  
Portland Cement Plaster Mixes  
(Ten-Thousandths of an Inch)



between basecoat plasters and finish coat plasters contributes to severe failures in smooth finished cement plaster.

To further test this theory, it is proposed that test panels be constructed under controlled conditions and observed over a period of time.

Arrangements have been made to construct test panels at the Sacramento Apprentice School under the supervision of Khalil Bennett, a leading Sacramento plastering contractor, who for many years was the apprenticeship instructor in Sacramento.

Four series of test panels will be constructed and observed. A series will consist of four panels, thus producing a total of sixteen panels in the test.

Each series of four panels will receive a different mix of basecoat plaster in common use in California.

(Continued on Page 61)

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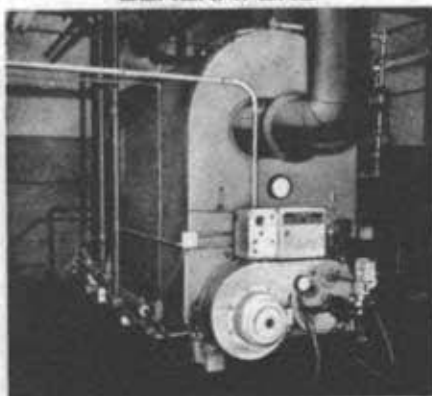
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## REAR ADMIRAL A. C. HUSBAND, CEC-USN

### NEW CHIEF OF THE BUREAU

Rear Admiral **Alexander C. HUSBAND**, Chief of the Bureau of Yards and Docks and Chief of Navy Civil Engineers, graduated from the U.S. Naval Academy in 1935.



Rear Admiral A.C. Husband

Following two years of sea duty aboard the cruiser USS RALEIGH, he was ordered to postgraduate school at Rensselaer Polytechnic Institute where he earned a Master's degree in Civil Engineering.

Transferring to the Civil Engineer Corps in 1940, Admiral Husband led the Seabees of the 128th Naval Construction Battalion in the assault on Okinawa during World War II.

Following World War II, he served in various positions of progressive importance until his assignment as Assistant Chief of the Bureau of Yards and Docks for Management and Comptroller in 1960. Thereafter he served as Director of the Bureau's European-Middle East Division and returned to Washington in July 1963 as Director of Facilities Management in BUDOCKS.

In May 1964, he was designated Deputy Chief of the Bureau of Yards and Docks and Deputy Chief of Navy Civil Engineers which position he held until his appointment as Chief of the Bureau of Yards and Docks and Chief of the Navy Civil Engineer Corps on 1 November 1965.

Admiral Husband holds the Bronze Star Medal with Combat "V" in addition to the following decorations: the American Campaign Medal, the Asiatic Pacific Campaign Medal with star, the World War II Victory Medal,

the Navy Occupation Medal with Asia Clasp, the National Defense Service Medal, and the Philippine Liberation Ribbon.

The Admiral is a fellow of the American Society of Civil Engineers and is a member of the Society of American Engineers, the National Society of Professional Engineers, and the Board of Directors of the Navy Mutual Aid Society. He is also a Registered Professional Engineer in the State of Rhode Island.

## REAR ADMIRAL ENGER, CEC-USN

### NEW DEPUTY CHIEF

**Walter Melvin ENGER** was born in Urbana, Illinois, on May 1, 1914, son of **Melvin S.** and **Mary A. (Crowford) ENGER**. He attended the Uni-



Rear Admiral Enger, CEC/USN

versity of Illinois at Urbana, from which he received the degree of Bachelor of Science in Civil Engineering in 1935. He was subsequently employed as an Engineer with the Bureau of Reclamation (Department of Interior) at Denver, Colorado; Parker Dam and Shasta Dam, California. He was commissioned Lieutenant (junior grade) in the Civil Engineer Corps of the U. S. Naval Reserve on August 27, 1941. Advancing progressively in rank, he subsequently attained that of Captain, to date from October 1, 1956, having transferred from the Naval

Reserve to the Regular Navy on March 17, 1943.

Ordered into active Naval service, he reported in September 1941, as Facilities Officer in the Office of the Inspector of Naval Material, Los Angeles, California. He remained there until June 1942, after which he served as Assistant Officer in Charge of Construction, Civil Works, San Pedro, California. He was Officer in Charge of Construction, Civil Works, San Diego, California, between January and October 1943, when he became Assistant Officer in Charge, Civil Works, San Francisco, California.

He had training at the Naval Construction Battalion Center, Davisville, Rhode Island, from May to September 1944, then served for a year as Executive Officer of the 59th Naval Construction Battalion. In September 1945 he transferred, in a similar capacity, to the 72nd Naval Construction Battalion and while attached to that unit also had duty as Acting Officer in Charge. He became Officer in Charge of the 31st Naval Construction Battalion in January 1946 and in June of that year reported as Assistant Superintending Civil Engineer of Area IV, with headquarters in New Orleans, Louisiana. Continuing duty in the New Orleans area, he served from July 1947 to August 1948 as Deputy District Public Works Officer in the Eighth Naval District.

In August 1948 he became an Instructor in the Department of Marine Engineering at the Naval Academy, Annapolis, Maryland. He remained there until May 1951, then served as Public Works Officer at the Marine Corps Base, Camp Pendleton, California. Assigned in October 1953 to Bureau of Naval Personnel, Navy Department, Washington, D. C., he had duty in connection with CEC Detail until September 1956, when he joined the Staff of Commander Naval Construction Brigade 10, to serve as Operations Officer and Engineering Officer.

He was Deputy Chief of Staff to the Commander Naval Construction Forces, Pacific, during the period September 1956 to June 1959 and in September of that year reported as Public Works Officer and Resident Officer in Charge of Construction at the Naval Air Station, Point Mugu, California. In August 1961 he became Assistant Chief of the Yards and Docks for Military Readiness, Navy Department, and in

(Continued next Page)



# U S A HOMES DEDICATION

By Fred Winne, J01

Rota, Spain — The U.S.A. Homes Housing Project in Rota, Spain, was officially opened as Rear Admiral **Henry A. Renkin**, Commander Service Forces, U.S. Atlantic Fleet, cut the ribbon in Area "A".



At the USA Homes dedication on the Joint Spanish/U.S. Naval Base Rota, Spain on November 1, Rear Admiral **Henry A. RENKIN**, COMSERV-LANT takes a big cut at the ribbon in Area "A" of the new housing project with the help of Commander **James T. ACUFF**, Commanding Officer of USN MCB-7. Looking on (l to r) are Rear Admiral **Joaquin M. PERCY**, Commander Naval Base Rota, Captain **Jack C. YOUNG** CNA Spain, and Captain **James S. ELKINS Jr.**, Commanding Officer, Naval Station, Rota.

Present at the ceremonies were Rear Admiral **Joaquin M. PERCY**, Commander Naval Base Rota; Captain **Francisco J. ELIZALDE**, Deputy Commander Naval Base Rota; Captain **Jack C. YOUNG**, Commander Naval Activities, Spain; Captain **James S. ELKINS, Jr.**, Commanding Officer of the Naval Station, Rota, and Commander **James T. ACUFF**, the Commanding Officer of U.S. Naval Mobile Construction Battalion SEVEN.

USN MCB-7 has been aboard the Rota Naval Base since arriving on July 26. The Battalion began erecting the houses almost immediately and have been busily erecting the homes each day that the weather permitted. At the height of their deployment, the men of the erection crews completed 1.7 units on a single day.

The pre-fabricated units are manufactured in Thompson, Georgia, and are shipped to the Rota Naval Base in crates. Each duplex unit is in

22 crates which weigh in excess of 100,000 pounds. The crates are positioned around the foundation of concrete, broken open and the erection crew and the crane operator move in. The units take shape like a gigantic jigsaw puzzle as the pieces are fitted into place. From floors to the roof, all come in pre-numbered sections which fit into their exact place in the building. When the outside of the units are completed the finishing crews move into the building and lay the tile flooring, put in all of the trim which goes with the home and connect the plumbing, furnace and electricity. All that is left is to have the families of the Rota-based personnel move into the finished dwellings.

At the present time there are a total of 20 units ready for occupancy and it is planned that before the Battalion turns the project over to the civilian contractors and departs Spain on December 1, there will be 98 units erected and 36 units available for occupancy.

## VIPS VISIT SEABEES

Three United States Congressmen and five important U. S. military leaders visited briefly with members of MCB-FIVE near Da Nang, Republic of Viet-Nam Monday, October 11th.



General Mark Clark, left, and Congressman L. Mendel Rivers of South Carolina talk with Seabees and Marines near Seabee Camp Hoover, Da Nang, Viet-Nam. Seabee E. W. Mixon, South Carolina native, stands to the immediate left of Representative Rivers. Marines are unidentified.

Representatives L. Mendel Rivers of South Carolina (Chairman of the House Armed Services Committee, Porter Hardy, Jr. of Virginia, and Speedy O. Long of Louisiana (both committee members) chatted for a few minutes with Seabees from their respective states.

The statesmen were escorted on a tour of various military organizations by Presidential Advisor General Mark Clark (ret.) and General William C. Westmoreland, Commander, U. S. Military Assistance Command, Viet-Nam.

This group was met in Da Nang by Major General L. W. Walt, Commanding General, Third Marine Amphibious Force; Brigadier General K. B. McCutcheon, Commanding General, Third Marine Aircraft Wing, Brigadier General M. D. Henderson, Assistant Division Commander, Third Marine Division; and the Commander, 30th Naval Construction Regiment, Captain Nelson R. Anderson, all of whom helicoptered into the MCB-FIVE area.

Commander William F. Russell, MCB-FIVE Commanding Officer, officially welcomed the entourage to the Seabees' Camp Hoover area.

Commander Russell learned of the lawmakers' surprise visit only thirty minutes prior to their arrival, and quickly notified men from Louisiana, South Carolina, and Virginia. The Seabees, formed into three ranks, shook hands and talked with their congressmen at a helicopter landing pad adjacent to Camp Hoover.

(Continued from Page 32)

December 1963 was ordered detached for duty as Director of the Chesapeake Division of the Bureau of Yards and Docks with headquarters at the Washington (D. C.) Navy Yard Annex.

On 1 November 1965, he was advanced to the rank of Rear Admiral in the Civil Engineer Corps and was appointed Deputy Chief of the Bureau of Yards and Docks and Deputy Chief of Civil Engineers of the Navy.

Rear Admiral Enger has the American Defense Service Medal; American Campaign Medal; Asiatic-Pacific Campaign Medal; World War II Victory Medal; Navy Occupation Service Medal, Asia Clasp; and the National Defense Service Medal.

His "home town" address is Urbana, Illinois. He is married to the former **Charlotte Hope Tuttle** of Urbana, and they have two children, **Susan Hope** and **Thomas Arthur Enger**.

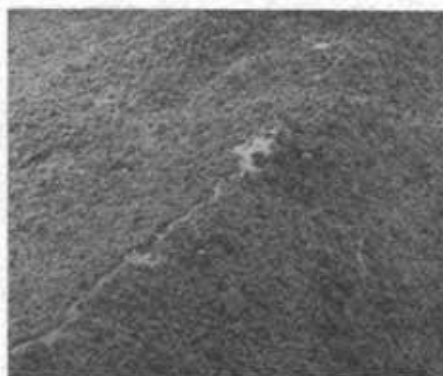
# SEABEES IN VIET NAM

## MCB 3

By Robert J. DYE, J03, USN

DA NANG, Vietnam—High above the harbor here, seabees from U. S. Naval Mobile Construction Battalion (MCB)-3 work on one of the most prominent mountains in the Da Nang area.

In response to a request from the III Marine Amphibious Force, the



Aerial view of pioneer road on mountain near Da Nang, under construction by Seabees of MCB-3.

Seabees began construction of a helicopter landing pad, and an expeditionary road to the top of the mountain.

With high explosives and heavy construction equipment, such as D-8 bulldozers—the largest used by the Seabees—they began clearing large boulders from the mountain-top. Using machetes, bowie knives, picks and shovels to clear the jungle foilage, the Seabees have now completed the pad and the road is near completion.

Supplies are air-delivered to the seabees in the remote area daily by Marine helicopters.

Working under a tropical sun with temperatures ranging well over 100 degrees and humidity in the high 60's. The Seabees are constantly on the lookout for Viet Cong—as well as reptiles and wild beasts that roam the surrounding jungles. Armed with M-14 rifles, and M-60 machine guns, half of the Seabee unit stands security watch while the others work.

The project officer, Ltjg. Kenneth Gammon, of Vicksburg, Mich., a

member of the Navy's Civil Engineer Corps, of Port Hueneme, Calif., reports that work is moving along smoothly with the help of "A" Co. personnel; **Richard N. NANCE**, constructionman apprentice, of Myrtle, Miss.; **David M. MUELLER**, constructionman of Erlanger, Ky., and **Robert L. GOODNIGHT**, constructionman apprentice, of Urbana, Ill.

Pioneering the expeditionary road is being accomplished by MCB-3. The final road, to be completed later this year, will be developed by MCB-9.

The commanding officer of MCB 3, Cmdr. **James Douglas RUMBLE**, of Carmel, Calif., also a member of the Navy's Civil Engineer Corps, says he is "proud of the fast and efficient work my men are doing in support of the Marines in the Da Nang area."

## MUD

By L. T. Tatham J02, USN

The Seabees of MCB-FIVE will be out of a jam if they can preserve roads the monsoon is trying to turn into jelly.

The monsoon rains began with a vengeance during the second week of October. Important supply routes



Crew from MCB-FIVE's "Delta" Company installs culverts to improve road conditions.

near Da Nang, Viet-Nam, many sections of which could not be hard surfaced before the rainy season, became quagmires under the incessant onslaught of the rain. Heavy trucks dug deep into the roads; many

vehicles could not get through at all.

The importance of the roads demanded immediate action against the traffic-slowing mud. Rock was needed to stabilize the roads, and many more culverts were required to drain the overflowing ditches. The giant rock crushing machinery was set in motion on an around-the-clock basis, as were dump trucks, bulldozers, front end loaders, and other familiar Seabee machines, all working to provide tons of rock for the road sections which were in danger of washing away.

The entire battalion was called out to help. And help they did, with determination and in fine spirits, despite being wet and knee-deep in mud day after day.

Headquarters Company personnel, who are not construction troops, pitched in with the best of them and set a fast pace for all. Forming long lines in hilly terrain too steep for the machines to climb, they threw stones down to the roadbed to fill and stabilize the slopes.

Thanks to such all out, all hands efforts, the main supply routes have been kept open. And the men of MCB-FIVE will continue to keep them open throughout the monsoon season.

## BRIDGE OVER RIVER TOURANE

by Bob Jordan, J0C

DA NANG, Vietnam — Although the incongruous-looking bridge over the river Tourane is considered vital to military operations in Da Nang, South Vietnam, you don't have to be a connoisseur of bridges to know that one doesn't mention it in the same breath with the George Washington, Golden Gate or San Francisco-Oakland Bay bridges.

In fact, the Tourane Bridge's only



claim to fame may be that through the years it is proving to be more

(Continued on Page 59)

# Well Drillers

By Bob Jordan, JOC

DA NANG, Vietnam—Realizing the importance of their job, especially in southeast Asia where fresh water is not readily available, the Seabee well drillers of U. S. Naval Mobile Construction Battalion NINE are a proud lot.



Clarence Trumble (left) and Wm. Murray (right) discuss problems.

"Without potable water, you're not long for this world," Clarence TRUMBLE, steelworker third class, USN, of Montrose, Colo., informed us as he knelt in the hot sand next to his cumbersome-looking well drilling rig.

"Getting water out here in Vietnam isn't as simple as running a connection to a water line on Main street, USA."

The 600-man battalion, under the command of Cmdr. Richard E. ANDERSON, CEC, USN, of Port Hueneme, Calif., is presently engaged in many projects. Among them is the task of building a 400-bed hospital in East Da Nang.

Trumble straightened up, wiped his brow, and squinting toward two long quonset huts about 500 yards away, said: "Next to those buildings, which are the beginning of the hospital, we've sunk a 60-foot well. It only took us 10 days."

One of the battalion's other well drillers—William MURRAY, utilitiesman third class, USN, son of Mr. and Mrs. Edward L. MURRAY of Rt. 5, Milton, Fla., joined in: "In only two days, we can cut down to an estimated 80 feet. We could do it in less time than that if we could keep water in the 900-gallon pillow tank."

The pillow tank is needed to cool the drill bit, float sand and silt out of the hole and form a temporary mud casing to keep the hole from collapsing.

Trumble, who is a graduate of the Navy's well drilling school in Rose Valley, Calif., explained that they

use several types of drills, depending on the soil and terrain.

He rapidly ticked off the drills—fishtail, pilot, roller, three-way and tungsten—while in the next breath he proudly talked about his one-and-a-half month-old son, Stephen Charles, who he hasn't seen yet.

His wife, the former Sandy NELSON, lives at 2218 Third St., Lubbock, Texas.

NMCB, located where the temperature passes the 100 degrees mark, uses 12,000 gallons of water a day. One of the battalion's projects is to supply water for the troops in the area. Besides the one already placed, NINE is drilling another at the hospital site, completed a 90-foot well at the battalion's camp, and will drill several other wells for the East Da Nang-based Marines.

"We are presently drawing water for our battalion from a natural spring in nearby Monkey Mountain," said Melvin A. KLAPPER, senior chief construction electrician, USN, of Port Hueneme, Calif. The Bravo Company Chief (Maintenance) said that as soon as the battalion received a pump it would start using the camp's well next to the galley.

"This will eliminate the long water haul from Monkey Mountain to the camp," he remarked.

The importance of water in this hot and humid country was pointed out by Chief Klapper: "A short time ago, before we started hauling water from the mountain, we would bring it across the Tourane River by Ferry.

"For some reason the ferry was delayed one day and our men went about five hours without water. That brief dry spell taught us to appreciate our own water facilities."

The camp has several outdoor showers which are supplied by two 3,000-gallon pillow tanks. In order to conserve fresh water, however, the battalion regulates water hours.

Water tanks holding 2,500 gallons of water are also placed about the camp for fire and other emergencies.

Besides drilling for water in the DanNang area, NMCB NINE has a well drilling team—an equipment operator, steelworker, construction mechanic and utilitiesman—deployed in the southern part of Vietnam.

The "Can Do" Seabees of NINE—builders for the Navy-Marine team—have turned the hot sands of East Da Nang, Vietnam into an oasis.

## SEABEE ROAD JOB

Thanks to a U. S. Navy Seabee Technical Assistance Team, citizens of the newly independent Central African Republic are finding it easier

to visit their neighbors.

Members of Seabee Team 4-4 recently reported to the Navy's Bureau of Yards and Docks that 15 per cent of the road construction between Baoro and Bozoum, two principal cities in the new nation, has been completed. This represents a two-mile stretch of roadway.

The team is part of a Seabee "hands across the sea" program in which construction aid and machine instruction is provided to newly emerged nations or those countries hit by a natural disaster.

Success of the program is shown by the fact there are many more requests for teams than there are teams available.

## GENERAL WADE, USMC VISITS CAMP SHIELDS

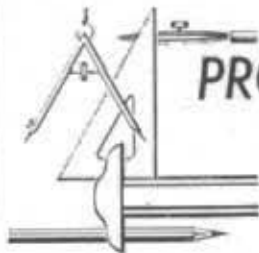
Camp Shields, Chu Lai, Republic of Viet-Nam. On October 26, 1965 Major General Sidney S. WADE, USMC, Commanding General, Fleet Marine Force, Pacific Forward) vis-



Major General Sidney S. Wade, USMC, (center) Commanding General, Fleet Marine Force, Pacific visited U.S. Naval MCB-10 at Camp Shields, Chu Lai. He is accompanied by Commander T. C. Williams, CEC/USN (left), Brigadier General F. J. Karch, USMC (right), Assistant Division Commander, 3rd Marine Division.

ited Camp Shields, Chu Lai, Republic of Viet-Nam. Following lunch he was briefed by the Commanding Officer, U. S. Naval Mobile Construction Battalion TEN, Commander T. C. Williams, Civil Engineer Corps, U. S. Navy of Texarkana, Texas on the projects that the Seabees of MCB TEN have accomplished as well as their projected work for the Chu Lai enclave. The largest project accomplished to date was the construction of an 8,000 foot expeditionary airfield for the use of Marine Skyhawk attack bombers, and the most recent is the construction of a complete major heliport consisting of two 600 foot by 900 foot helicopter landing pads.





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## OPERATION 'DEEP FREEZE'

BY P. V. BRANDT, JO2

### First Impressions of Antarctica

The heavily clothed sailor stood on the ground next to the huge C-121J Super Constellation which had just brought him to Antarctica on the first wheeled flight of the Operation DEEP FREEZE 66 season.

He stood, awed by the overwhelming natural spectacle of what he felt must be the greatest show on earth. The land was white—pure,



virgin white, as far as the eye could see. The mountains were white, the ground was white, the snow covering the ice runway was white. He thought to himself, "I wonder if Heaven is this beautiful?" Then, as if awakening from a trance, he added aloud to no one in particular, as he shivered and stomped his feet, "I hope it's not this cold."

It didn't take the sailor long to feel the 37 below zero antarctic cold. He had never before been in such bone chilling cold. The wind whipped against him as if trying to force him back onto the plane. The snow stung his forehead, his nose, his eyes narrowed to slits to keep the razor sharp snow from temporarily blinding him.

He felt as though the land were trying to discourage him from staying... was saying, "I am the antarctic. Leave me, puny man. You cannot conquer me. My cold will freeze you, my snow will blind you. I will drive you from my land."

He looked around. There were some other sailors rushing around the huge, silver plane refueling it for its 2200 mile return flight to Christchurch. He watched as the cargo was unloaded. He viewed the entire operation, knowing it would be repeated many times before the long winter night would descend over the land and envelope it with its six month pitch black night and its impenetrable winter storms.

Then he noticed the waiting helicopter and, with some of his shipmates, he climbed aboard for the short hop to McMurdo Station, the largest U. S. base on the icy continent.

As all "Angels," the helicopter was noisy and shaky as it ascended into the air and then turned toward a hill far away. It was warm in the copter and the sailor pushed his parka hood back to his shoulders and peered out the window curiously at the stark whiteness around and below him. It was a rough ride towards the hill. Soon he noticed some small buildings on the side of the hill. The ground around the small buildings was dirty black as if a plague had diseased the side of the hill and left, wandering to find another hill, to infest it too and leave.

Before he had a chance to see anymore, the helicopter gently set down and the sailor was even more firmly convinced that Navy pilots were the best in the world. He climbed out, threw his seabag over his shoulder, and trudged up the side of the hill, away from the heliport, towards the small huddle of buildings that he would soon come to know intimately.

As he began, his pace was fast and brisk up the side of the hill, but soon, too soon he thought he began to tire and he wondered if the bitter cold of the antarctic had anything to do with it. He would soon learn that it did. He would tire many more times before he left the "ice."

He stood still for a moment and surveyed his surroundings... his home. He looked at the small Jamesway Huts, their cloth walls being pushed in and sucked out by the wind—they look awfully fragile he thought, much more fragile than the wooden one story buildings. He noticed for the first time that the mountains across the ice covered McMurdo Sound had a bluish hue to them. The color made them look all the more beautiful.

He turned and noticed the smoke stacks leading out of the small buildings and Jamesways. The smoke curling out of them meant warmth, cover from the cold, conversation, comradeship—important things in a land that is so beauti-

fully cruel and icily cold.

As he stood on the side of the hill, he thought of early explorers to the land—Scott, Mawson, Byrd... men who had stood on the same land he was standing on now. Men who had died so this and other small settlements could be opened on the world's last frontier. In a small way, he felt a certain closeness to these men. They had come to this land to explore its plateaus, to map its coasts, to climb its mountains. Now, in 1965, he too was here, one of the very few who could say that "I have served in Antarctica, I have felt the same cold that Scott felt, I have walked on the same snow that Byrd walked on."

Suddenly, he shivered and mumbled to the ghosts of past explorers, "The hell with it, I'm cold." He turned to a hut and, knowing he would find warmth and people there, walked in.

## CDR. JEHU BLADES, USN RETURNS TO STATES

Commander Jehu BLADES, USN, Commander of the U. S. winter-over party in Antarctica for the past seven months departed here for the United States.

Cdr. Blades tour ended when Captain Henry M. KOSCIUSKO, USN Commander Antarctic Support Activity, disestablished the winter-over command.

Cdr. Blades assumed his unique command, with headquarters at McMurdo Station, Antarctica, last February just prior to the departure of the last ships and last aircraft to the outside world. During the winter months (March through September in Antarctica) no ships or aircraft could reach the frozen continent, and radio was the only means of contacting the rest of the world.

In April the sun disappeared, not to reappear until August. Storms accompanied by high winds and extremely low temperatures were the norm.

As commanding officer of the winter-over party Cdr. Blades was directly responsible for four small bases scattered over the continent (including one at the geographic South Pole), as well as the main station at McMurdo Sound.

A total of about 300 Americans, scientists, and sailors, comprised the

(Continued on Page 39)

(Continued from Page 38)

wintering over group with most of them at McMurdo Station.

Asked what the men did during the winter to keep busy and to amuse themselves the commander replied, "Contrary to what one might think, winter is a busy season, indeed. The first job to be done before total darkness sets in is the repair and rehabilitation of facilities which are used to their limit during the large scale activity of the summer."

He went on to explain that next came many station improvement projects. "In this way our bases become more livable and useful each year," he said. "As the next summer season drew near everyone's efforts were concentrated upon building a completely new airfield with its supporting facilities and buildings. Since the airfield must be built upon ice which is constantly moving and changing, it must be dismantled and reconstructed in a new position once every few years.

"For recreation, "the naval officer said, "the men have their choice of a wide variety of indoor activities such as stereo music reproduction, bowling, ping pong, etc. Outdoors when the weather permits they go exploring the ice caverns nearby and even play an occasional game of football.

Everything in Antarctica depends on the weather, the most violent weather anywhere in the world. At McMurdo Station winds reached almost 100 mph during one storm and temperatures approached 50 degrees below zero Fahrenheit. This was balmy, however, compared to the temperatures recorded at Amundsen-Scott Station at the South Pole. The mercury there reached a record low of 113 degrees below zero during the month of August. (The middle of the antarctic winter).

Wintering with the American Party at McMurdo Station was Dr. Igor Zotikov, Soviet exchange scientists representing the Academy of Science in Moscow. A recognized authority on heat transfer, Dr. Zotikov was studying this function in relationship to the formation and deterioration of polar ice.

Dr. Zotikov's presence at McMurdo is only one example of the spirit of international cooperation which is the rule in Antarctica. There is an active interchange between McMurdo and New Zealand's Scott Base, on both scientific and personal levels.

On Oct. 3, the first aircraft from the outside world in seven months

landed at the new airfield at McMurdo Station. On board were Rear Admiral F. E. Bakutis, Commander Naval Support Force, Antarctica, and Capitan Kosciusko. Admiral Bakutis is leading a force of 4,000 men in this summer's scientific assault on Antarctica, the world's last frontier.

Asked about his feelings upon returning here after his long isolation, Cdr. Blades said, "The season has been a tremendously rewarding one

for me. Now I want to hurry back to my family, because the season has also been a very long one.

Cdr. Blades is married to the former Cecilia Koehler, who had been residing with the couple's five children in East Greenwich, R.I. After a short leave period, the commander and his family will be off to a new tour duty at the University of Colorado in Boulder, Colo.

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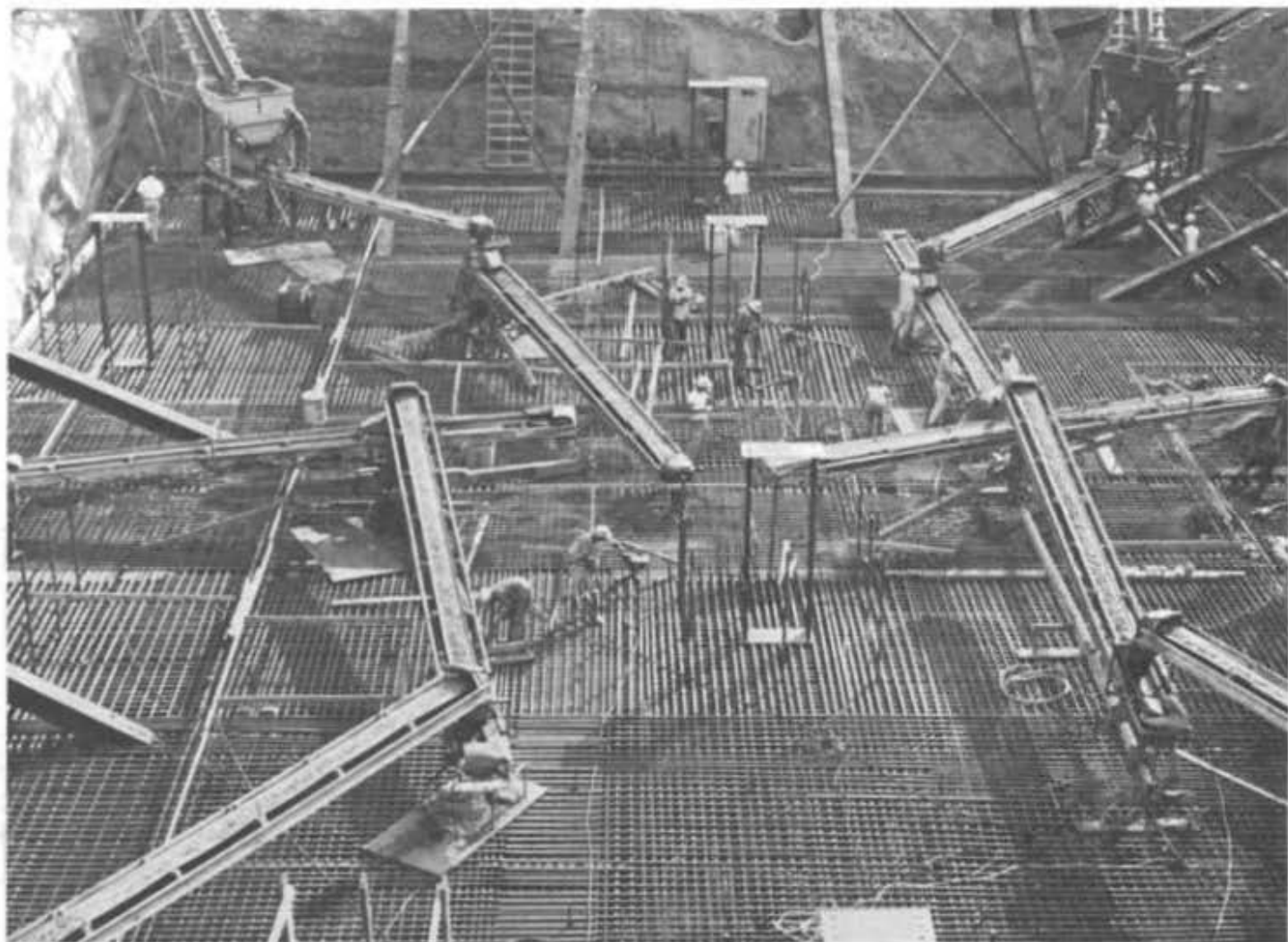
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## A 4,800-cu. yd. continuous pour

Thorough advance planning and full use of modern equipment enabled the Trepete Construction Co., of San Diego, to place a 4,800-cu. yd. foundation mat in just 12 hours. The 96-ft. wide, 136-ft. long and 10-ft. deep mat will be the foundation for the 27-level First National Bank Building now rising between Fifth and Sixth Avenue on "B" Street in downtown San Diego, Calif. Concrete began rolling into place at 6:00 p.m. only 12 hr. later. The job took 4 hr. less than was originally scheduled.

This extraordinary performance can be traced to the meticulous advance planning on the part of the contractor, the cooperation of city departments, the precision scheduling of the concrete supplier, San Diego Consolidated, the use of high-speed, quickly-maneuverable conveyors made by Oury Engineering Co., and an all-out effort by the contractor's workmen.

Because of the downtown location of the job site, the scheduling and the deployment of the concrete trucks was of critical importance. No streets could be blocked — except temporarily, when trucks were moving into position. At times during the day Consolidated Rock's entire fleet of 81 transit-mix trucks was devoted to supplying concrete to the job. About 700 truck loads were needed.

The contractor's plan of carrying out the work was approved by the police department, the building department and the traffic department of San Diego. The police and traffic departments hooded parking meters where required, posted passenger and commercial loading zones, post-alternate bus stops, and provided over-all police control. The contractor furnished flagmen and uniformed special officers to control automobile and pedestrian traffic.

Trucks unloaded at the four corners of the excavation. Two trucks could unload at the same time at each of the four points. Concrete was discharged into metal chutes made by the contractor which led down to 2-yd. hoppers spotted at each of the four corners of the mat. From the hoppers the concrete traveled by con-

veyor to all parts of the mat.

Specifications called for the entire 4,800 cu. ft. of concrete to be placed continuously so that the mat would have no cold joints. Considering the restricted location of the mat and the high rate of placement required, the contractor rejected the use of buggies and runways, and decided to use conveyors instead. The decision paid off in a big way. One entire crew which was scheduled to report at 7:00 p.m. did not have to show up at all because of the early completion time.

The Beltcrete conveyors have been used successfully on a number of bridge decks and building slabs in the West in the last year or two but the manufacturer will have a hard time finding a job which better illustrates their merits than this one. The standard Beltcrete unit consists of a 32-ft. long aluminum frame which carries a vulcanized endless belt. The belt has no metal lacings, which permits the use of a steel scraper under the head pulley to keep the belt clean. Each section carries its own 5-hp. electric motor, and is mounted on a swivel frame at the other. Rubber hoods and spouts at the discharge end permit belt speeds of 600 ft. per min. without soilage. When the sections are hooked up in series, the final one can be retracted or extended 30 ft., moved up or down 20 deg. or swung entirely around in a circle. Even when the final belt is carrying a full load, two men can lift and move the discharge end.

On the San Diego project, two of the four conveyor lines contained two Beltcrete sections, while the other two contained three. Only one of the lines used a skid mount for the discharge end — the others featured the cantilevered swivel version. In this newer model, the final or discharge conveyor is mounted on a special support frame which enables the entire 32-ft. section to be extended without any support on the other end. One man can easily swing the entire section around or telescope it in and out. The final section on two of the four lines was "Power Pack" units in which all motions are made under

power from a control panel. By turning knobs an operating engineer can raise or lower the end of the discharge belt, move it in or out 25 ft. or swing it in a circle.

The schedule worked out by project manager Charles McMahan called for a pouring rate of 150 cu. yd. per hr. from 6:00 a.m. to 7:00 a.m., 250 cu. yd. per hr. from 7:00 to 8:00 a.m. and 400 cu. yd. per hr. from 8:00 a.m. to completion. The work force was divided into four crews. Crew A was to start at 6:00 a.m., work six hours, and return at 7:00 p.m. if needed (they weren't needed). Crew B started at 8:00 a.m. and worked until 3:00. Crew C started at noon and worked until 7:00. Crew D started at 3:00 and worked until 10:00 p.m.

A typical crew consisted of a carpenter foreman, five carpenters, a labor foreman, eight vibrator men, two hopper men, three laborers, four uniformed guards, two ticket signers, four truck spotters, two iron workers, one electrician, and a belt operator for each line (supplied by Oury Engineering Co.). The last two crews were supplemented by eight cement finishers and eight cement finishers helpers.

In the two weeks prior to the pour, the foundation was laced with 1,124,082 lb. of reinforcing steel. Near the 12 main columns, the rebar is 2 1/4 in. in diameter. The remainder of the area was covered by a network of 1 1/4-in. bars.

A retarder was used to delay the setting of the concrete. The mix included Pozzolith No. 8, five bags of cement per cu. yd., and 1 1/2-in. aggregate. A 6-in. slump was used and compressive strength ran over 3,900 psi. called for in the design. The internal heat developed was only 30 deg. over air temperature, so no cooling was needed.

Next step in construction of the 388-ft.-high building will be the pouring of the side walls around the perimeter of the 150 x 200-ft. lot and the positioning of steel beam supports from the building mat to the side walls. First structural steel was scheduled to go into place in December 1964.

# C. E. M. E. Corporation

C.E.M.E. meaning, Civil, Electrical, Mechanical Engineers, was until the summer of 1965 a quality engineering service for commercial, industrial, and defense facilities. From its inception in 1959, the original staff



William J. Mockridge

was broadened by additional engineers and architects, bringing with them a reservoir of experience and capabilities. This enabled the Corporation to offer a complete service for the planning and design of more complex installations and facilities.

Established over six years ago, as an architectural design and service organization with a limited scope, it became apparent to management that a far greater opportunity and challenge lay in the actual engineering and construction projects for both military and industry. Then C.E.M.E. Corporation joined the ranks of the nation's prime contractors.

In the summer of 1965, coming to the realization that a great area of expansion lay in the construction field, the C.E.M.E. Corporation decided to make the forward step. This now presents a Corporation which is able to undertake any and all portions of a construction project from basic planning and engineering studies through the final design and construction.

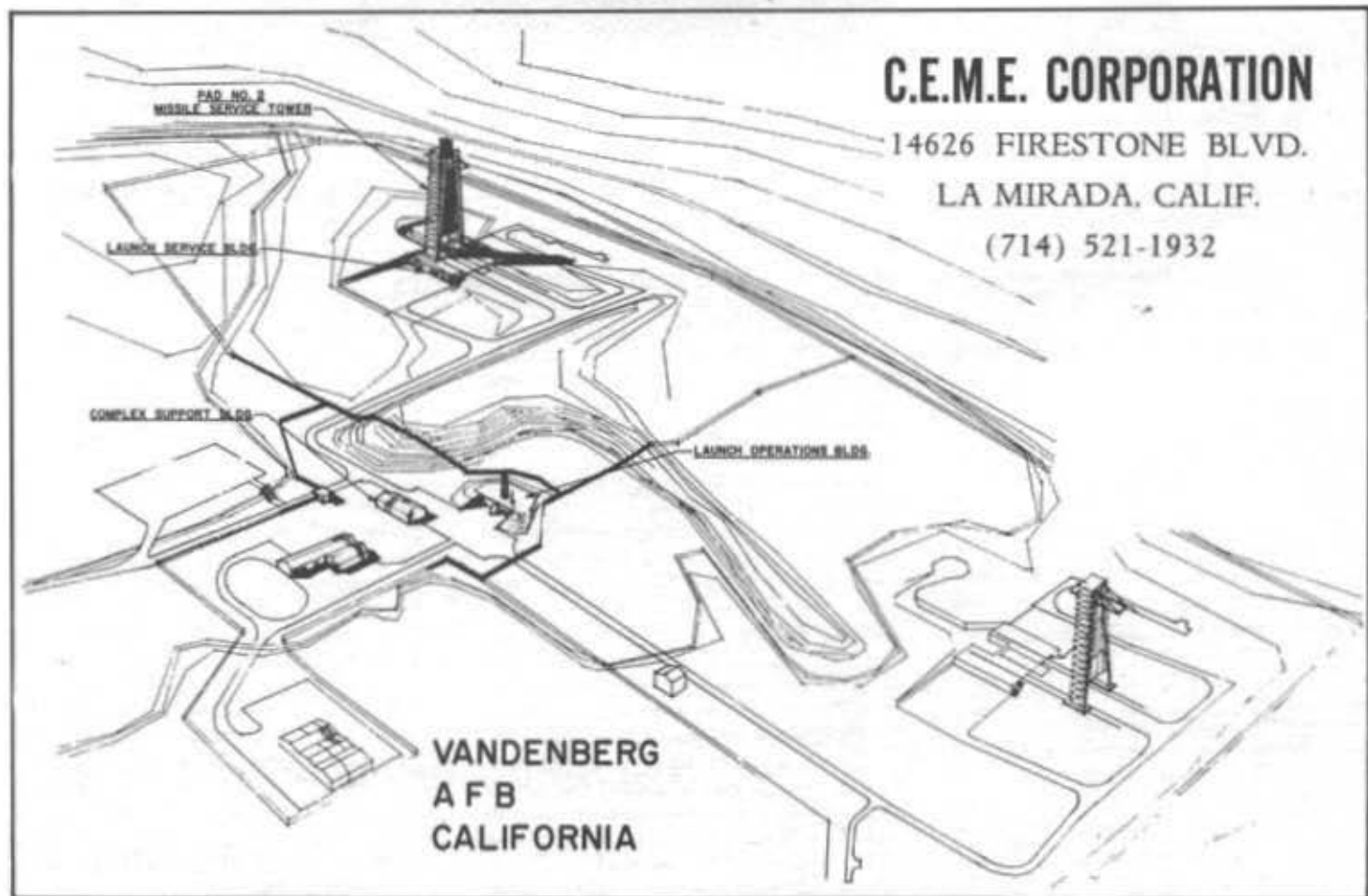
One of the features of the C.E.M.E. way of doing things is the use of P.E.R.T. C.E.M.E. having a high capability in the development of P.E.R.T. network to portray the details of any engineering or construction project and the ability to utilize these net-

works as a basis for management of the project, real benefits and profits in time are the results. C.E.M.E. has several different P.E.R.T. and C.P.M. computer programs that were written to provide various combinations of information and can meet specific requirements almost in infinite variety.

C.E.M.E. Corporation of La Mirada, California, recently received a United States Army, Corps of Engineers contract to construct Bomarc Missile System Facility at Vandenberg Air Force Base, California. The facilities will be used by Naval Missile Center, Point Mugu, California for a modified Bomarc Target Program. This is only one of many contracts recently awarded to C.E.M.E. by the United States Government.

At Douglas Space and Missile Center in Huntington Beach, California, C.E.M.E. Corporation is installing the utilities cryogenic services test pad. This is cryogenic nitrogen installation involving both cryogenic piping and erotic instrumentation. Also, in this same field, similar cryogenic system has been completed for the Air Reduction Pacific Company

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# Keith electric corporation



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Installations of Pal-1 Pad 2 Missile Service Tower located at Vandenberg Air Force Base for the U.S. Army, Corps of Engineers is now under construction by the C.E.M.E. corporation and will be complete around Feb. 1, 1966.

Growth is the keynote at C.E.M.E., where virtually every employee is a



chief, not in title, but in abilities and duties, with better than a million dollars of construction currently underway, a great amount of diversification is apparent. At Vandenberg Air Force Base, a conversion of an existing missile facility to modern day requirements is underway, while 40 miles away, and 3 miles off-shore, C.E.M.E. Corporation is installing the process piping on two off-shore oil production platforms.

Mr. William J. MOCKRIDGE, M.E., A.I.B.D., President of C.E.M.E., is a graduate of the University of Southern California, Los Angeles, with a B.S. Degree in Mechanical Engineering. Additional studies at the University of California, include Hydraulic Engineering, Administration of Government contracts and Subcontracts, Legal Aspects of Government Contracts and Subcontracts and Advanced Critical Path Scheduling.

Mr. Mockridge's experience consists of design and construction of structural, mechanical and electrical facilities.

As president of the C.E.M.E. Corporation, his duties entail the responsibility for all company operations, such as Engineering, Design and Drafting, Estimating and Construction. He is very capably assisted by August R. BUTLER, Vice President of the firm.

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# ISLAND NEWS

## HERE, THERE, EVERYWHERE



Island News — Illinois —

Due to vacations and many other summer activities, X-18 and Auxiliary were late with their election of officers for 1965-1966. The following were elected at a recent meeting.

ISLAND X-18 . . . .

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**Mr. John W. Humrichous**

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1st V. PRESIDENT

**Mr. Harold R. Wood**

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Hoopeston, Ill. 60942

2nd V. PRESIDENT

**Mr. Leonard Cousins**

1209 10th St.  
Covington, Indiana 47932

SECRETARY

**Mr. Leonard Cousins**

1209 10th St.  
Covington, Indiana 47932

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**Mr. Donald L. Engel**

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Danville, Ill. 61833

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**Mr. Donald McFarland**

201 E. Lincoln  
Hoopeston, Ill. 60942

COUNSELOR

**Mr. Donald L. Engel**

3830 N. Lake Blvd.  
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423 W. Elm St.  
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**Mr. Donald McFarland**

201 E. Lincoln  
Hoopeston, Illinois 60942

**Mr. James Sheehan**

R. R. # 2  
Hoopeston, Ill. 60942

SERVICE OFFICER

**Mr. James Sheehan**

R. R. # 2  
Hoopeston, Ill. 60942

**Miss Bonnie WOOD**, daughter of **Roberta** and **Harold Wood** is attending Danville Junior College and living at the YWCA in Danville. Another daughter **Betty** is very busy with all her school activities as Varsity Cheer Leader and Majorette of the Hoopeston High School Band.

At last report **Susan THORNTON** is buried in studies at Eastern Illinois University. I'm sure Susy appreciates the many kind things said about her tribute to the Seabees. Her sister **Sherry** is Varsity Cheer Leader at

Georgetown High School. Haven't heard too much about brother **Stu** who is 10 years old, or maybe he is 11.

"Mike" **WILLIAMS** at last report has been in Viet Nam for some time now. **Pam** who was recently married to **Elba MONROE** are located at Chanute Air Force Base. They are the son and daughter of **Marie and Brb WILLIAMS**. A thrilling and proud moment came for **Annell and J. D. GANT** at the National Convention when the engagement of their son **Joe D.** to **Marg PLANBECK** was announced. **Annell** is a member of the Island X-18 Auxiliary. **J. D.** is Illinois Department President. **Joe D.** grew up with the Seabees, attending many Executive Board meetings and State and National Conventions. Our best wishes to them both.

**Mildred and Don ENGEL** enjoyed a long week-end in the Smokies in October at the peak of the Fall coloring. It was a most relaxing trip. **Carolyn and Leonard COUSINS** are on their way of Florida for Thanksgiving. We'll ask **Carolyn** to fill us in on their trip for the next publication.

Congratulations are in order to **Russell HARTMAN** of Kankakee who brought his new bride **Mary** to the Illinois Department Executive Board meeting, Nov. 14th.

ISLAND X-18 AUXILIARY OFFICERS  
1965-1966

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Georgetown, Ill. 61846

V. PRESIDENT

**Mrs. Don (Pat) McFarland**

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**Mrs. Donald (Mildred) Engel**

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Danville, Ill. 61833

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(Continued on Page 46)

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## LONG BEACH AREA

### ROICC AND STAFF

**CDR Charles CURIONE, CEC, USN** reported to DIRSOWESTDOCKS on 9 Sept 1964 for duty as Resident Officer in Charge of Construction, Long Beach Area and Officer in Charge of Construction (Limited Long Form Contracts) NASA, Seal Beach Facility, Seal Beach California.



A native of Nebraska CDR Curione received his Civil Engineering Degree from the University of Nebraska. During World War II, he served as a navigator in the U.S. Army Air Corps. He was commissioned as an Ensign in the U.S. Navy in June 1947. He has since served on Saipan, various Navy stations in the United States, Puerto Rico and Hawaii. His duties over the years have included supervision of design, planning, real estate, Public Works, research and construction. He was the Planning, Design and Construction Officer for the U. S. S. Arizona Memorial located at Pearl Harbor, Hawaii. In 1965, he was awarded a Master's Degree in Civil Engineering from the University of Illinois. He is a fellow in the American Society of Civil Engineers, a member of Sigma Xi, Sigma Tau, and the Society of American Military Engineers. He is a registered Professional engineer in the state of Illinois.

LCDR **David B. HATHAWAY, CEC, USN** reported to DIRSOWESTDOCKS in September 1964 for duty as Assistant Resident Officer in Charge of Construction, Long Beach Area, Seal Beach, California. LCDR HATHAWAY received his Bachelor of Science Degree in Electrical Engineering from Worcester Polytechnic Institute in 1953 and worked one year with Hazeltine Electronics Company as project coordinator, before entering Officers Candidate School in Newport, Rhode Island. Upon



graduating in December 1954, he had duty in the following areas: Assistant Resident Officer in Charge of Construction, Brooklyn Naval Shipyard; Assistant Public Works Officer, Rodman Naval Station, Canal Zone; MCB-4; Public Works Officer, Naval Radio Station, Cheltenham, MD.; Assistant Public Works Officer, Headquarters Support Activity, Taipei, Taiwan.

He is married to the former Harriet Bridges, and they have two children, Steven, age 8 and Jeanne, age 5.

**LTJG David THOMAS, CEC USNR** reported on 7 May to DIRSOWESTDOCKS for duty as Assistant Resident Officer in Charge of Construction, Long Beach Area, Seal Beach, California.



LTJG THOMAS was born in New Jersey; however, he grew up in the Los Angeles area and attended Santa Monica City College, Santa Monica, California. He received a bachelor and a master of science degree in Civil Engineering from the University of Washington, Seattle, Washington.

Entering the Naval Reserve in May 1958, he was Commissioned on 22 May 1962 and promoted to the rank of Lieutenant (junior grade) on 18 October 1963. He spent two months at CECOS, Port Hueneme, California before going to Adak, Alaska where he was the Project Liaison Officer in the Public Works Department at the Naval Station from September 1963 to April 1964. In his spare time, LTJG Thomas enjoys sailboat racing, furniture making and folk music.

He is married to the former Barbara Casey of Santa Barbara, Calif.

**LTJG Darrell G. MARKS, CEC, USNR** reported on 10 June 1965 to DIRSOWESTDOCKS for duty with the ROICC, BUDOCKS Contracts, Long Beach Area, Seal Beach California.

A native of Oregon, LTJG MARKS graduated in June 1963, from Oregon State University, Corvallis, Oregon with a bachelor of science degree in Civil Engineering.

Entering the Navy in May 1963, he was placed on inactive duty until September of that year when he reported for duty under instruction at OCS, Newport, Rhode Island. He was commissioned as an Ensign in February 1964 and attended the Civil Engineer Corps Officers School at Port Hueneme, California for two months. From May 1964 until coming to SOWESTDOCKS, he was assigned as Assistant Resident Officer in Charge of Construction, Naval Station, Adak, Alaska.

ENS **Warren Stanhard BAKER, CEC, USNR**, reported to DIRSOWESTDOCKS on 2 September 1964 for duty as Assistant Resident Officer in Charge of Docks Contracts, Long Beach Area. A native of Illinois ENS BAKER attended the University of Illinois in Urbana where he received a degree in Architecture. Commissioned in the navy in June 1964, he completed temporary duty under instruction at the Naval School, Civil Engineer Corps Officers Naval Construction Battalion Center, Port Hueneme, California before reporting to SOWESTDOCKS.

ENS **Michael D. McCaffery, CEC, USNR**, reported on 24 August 1965 to DIRSOWESTDOCKS for duty as Assistant Resident Officer in Charge of Construction in the Long Beach Area ROICC Office Seal Beach, California. A native of Kentucky, ENS McCaffery received a degree in Civil Engineering from the University of Louisville, Louisville, Kentucky. Before coming to SOWESTDOCKS, ENS McCaffery performed duty under instruction at the Civil Engineer Corps Officers School, Port Hueneme, California.

(Continued from Page 44)

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**Mrs. Flo. Kincaid**  
Route #9  
Hoopston, Ill. 60942

# LONG BEACH AREA ROICC A STUDY

This article was written in June before Lt. **BOOTHE** was transferred to OICC, SOWESTPAC (Manila). Thought you might enjoy it.

One of the more vexing problems of construction program management at the FEO level is that of providing field personnel at many independent naval activities. These activities, particularly the smaller stations, characteristically have a sporadic construction load, and the accepted practice of having FEO personnel assigned to a Public Works Officer who is also a ROICC is not sufficiently flexible to expand and contract with the construction load. When many customer activities are located within a relatively confined geographic area, the problem of inefficient manpower utilization is compounded.

Faced with these conditions in the Los Angeles Area, the Southwest Division, Bureau of Yards and Docks, elected to divorce the ROICC functions in contract administration from the OICC functions, which are traditionally and rightfully the "other hat" of the PWO, and consolidate them into one area office. As a result of this concept, the Long Beach Area ROICC Office was initially established in July of 1963 as an outgrowth by augmentation of the Seal Beach ROICC office which had previously only administered NASA construction contracts.

Under this Area ROICC concept, the construction representatives and inspectors, as well as AROICC who had previously been permanently assigned to various customer activities, were transferred to a central ROICC office designed to service the entire Greater Long Beach Area. Since the Area ROICC office has the consolidated function of post-award contract administration over an area of 2,000 square miles, personnel can be freely shifted to meet a continually fluctuating contract load at any given station or facility. The slightly increased transportation costs attendant to this concept have proven to be far overshadowed by the tremendous increase in effectiveness of each individual field employee as well as the ability to provide in-

creased construction coverage to customer activities during peak loads. As a result, the Long Beach Area ROICC Office, eight months after its inception, was handling \$20 million worth of construction contracts in force with twenty-six people. Prior to the consolidation, the same workload had required thirty-eight people. In addition, the consolidated office utilized essentially the same number of vehicles as had previously been assigned.

At least two other significant side effects were realized. Under the command and guidance of an officer of the grade of Commander, as ROICC, contract administration achieved considerable depth in experience level at those stations where a Lt. or Lt(jg) had previously been left to his own devices. In addition, the development and application of uniform policies regarding procedural matters, inspection, etc., was welcomed by the construction industry throughout the area. The application of consistent policy area wide has also strengthened the Navy's position in dealing with the business community.

Currently, under the control of **Commander C. CURIONE, CEC, USN**, as ROTC, the Long Beach Area office has five officers and thirty civilian personnel assigned. The organization (see chart) is divided into four zones of geographic responsibility, each headed by an AROICC, and with a central Technical Support Division for engineering backup to all zones. All submittals and formal correspondence are handled through the main office, but field offices are established at the location of major centers of work, and serve as the day-to-day point of contact by contractors. With the present over-all workload of twenty-six contracts totaling \$22 million being administered for five separate OICCs, business is booming. The projects under construction range from the U. S. Naval Hospital, Long Beach; the FY-1964 and FY-1965 housing projects; and the final phase of the Saturn S-II facility construction at Seal Beach right on down to numerous annually funded informal and short form contracts.

With this challenging and widely varying workload, the keynote for

office is flexibility, and this same flexibility is also the office's main strength.

Every employee is challenged to seek new ways to increase the quality and timeliness of completion of construction to better serve the ultimate user. It is through this spirit of unity and teamwork that the overall benefits of consolidation are ultimately attained. Even though new construction on the horizon is constantly changing the picture, the Long Beach Area ROICC Office can confidently look forward to ensuring maximum return for the construction dollar in the Los Angeles area for years to come.

## MEDICARE AND YOUR WIFE

Has your wife been keeping her true age from you all these years? You were 24 when you married her and she just couldn't bring herself to tell you she was 28? Well, now is the time for her to 'fese up to it, if during the passing years she's reached 65. You probably knew it all the time, but didn't want her to know you knew it.

Why should she own up now? Well, Medicare get into the act, and a little honest confession of her age could save you quite a chunk of cash come next July.

You see, even if you are a few years shy of it, your wife can qualify for Medicare if she's 65, even if she never worked out of the home and can't get monthly benefits from Social Security until you retire.

This is important. If your wife, or anyone else's, or anyone for that matter, will be 65 in the next couple of years, she will qualify for Medicare regardless of whether she ever worked under Social Security. March 31, 1966 is the deadline to enroll for Medical Insurance, for those who are 65, or will be yet this year.

Now, naturally the government has got a form or two for her to sign; but it's really quite simple. Have her bring along something to prove her age, and if she ever had a social security card of her own (even if she never used it), have her bring that, too.

Now, when you have just the right mood set, tell her you knew she's been four years older than you all along, you love her anyway, and tell her to get down to the Social Security Office as soon as possible. It's just a case of honesty being the best policy.

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# ARMY ENGINEERS KEEP WATERWAYS - HARBORS OPEN FOR COMMERCE



Commerce is the life-blood of the Nation and its waterways are the arteries that provide a continuous flow of agricultural and manufactured products for citizens in all parts of the United States.

Few if any American inland waterways or seacoast harbors could carry modern commerce if left in their natural conditions. Throughout most of the Nation's history—specifically since 1824—Federal improvement of these waterways has been a responsibility of the U. S. Army Corps of Engineers. This is another example of how the Corps perform 'Engineering for Human Needs,' Theme of National Engineer Week, February 21 to 27.

The Army Engineers had improved some 22,500 miles of inland and intracoastal waterways by the end of 1963. These included about 19,000 miles in commercial use, with about 12,000 miles of channel with depths of nine feet or more. These waterways (not including the Great Lakes) carried 430 million tons of commerce in 1963.

A main element of the inland waterway system is the 1,700-mile reach of the Mississippi River between Minneapolis, Minnesota, and New Orleans, Louisiana. Branching from it are the 325-mile Illinois Waterway, which is connected to the Great Lakes at Chicago; the 1,000-mile Ohio, which extends upstream to Pittsburgh, Pennsylvania, serves some of the Nation's leading industrial regions, and has a number of improved tributary waterways; the 730-mile waterway under construction on the Missouri River from its mouth to Sioux City, Iowa; and the 450-mile Arkansas River Waterway extending to the vicinity of Tulsa, Oklahoma, which also is under construction.

At its southern end, the Mississippi is connected with the 1,100-mile

Gulf Intracoastal Waterway which rims the Gulf of Mexico, connecting its harbors and industries. Tributary to the Gulf Intracoastal is the 415-mile Warrior-Tombigbee system which reaches to Birmingham, Alabama, and taps a leading industrial region of the South. The east coast is served by the Atlantic Intracoastal Waterway, which extends about 1,400 miles along the coastline from Trenton, New Jersey, to Miami, Florida.

A number of techniques have been employed by the Army Engineers in improving these waterways.

An **open-river navigation channel** may require a great deal of highly skilled and specialized engineering. Most rivers of any length include rapids, shallow reaches, sharp bends, and locations such as confluences where sediment is regularly deposited in such volume as to obstruct navigation. Frequent dredging by the Corps, may be necessary to maintain a channel of reliable specified dimensions. Sometimes the banks tend to cut away. Plains rivers like the Missouri often have shifting, unstable channels. Various kinds of training and bank-stabilization works are often needed to contract, shape, and stabilize the river channel. Cut-off channels may be built around rapids or falls.

Some rivers lack the reliable volume of flow needed to carry modern barge commerce throughout the navigation season. In such cases the navigation system proper must be supplemented by reservoirs where water can be stored during periods of excess run-off for release as needed to maintain navigable depths during dry seasons. The outstanding examples of this kind is the Missouri River, where the Army Engineers built six great reservoirs in the middle reach of the river. Combined, they can store enough water

to equal three years of normal stream flow and have made possible the development of a stabilized open-channel waterway in the lower 730 miles of river. (These reservoirs also function for flood control, hydroelectric power generation, and many other beneficial purposes).

Some of the measures used to keep channels open are applicable equally for navigation and for carrying off flood flows. In practice, therefore, channel-improvement programs like that in the Lower Mississippi Valley often serve navigation and flood control simultaneously. Upstream reservoirs also may be planned and operated so as to function for both flood control and navigation. The water supply, power, and other services provided by multiple-purpose reservoirs may help make possible urban and industrial development contributing to the commerce carried by the waterway.

Sometimes an open-river channel is not feasible, usually because stream flow of the necessary volume is not dependably available; yet the existing or potential economic development of the valley merits waterway transportation. In such cases the river may be **canalized**. A series of dams is built, each one located at the head of the pool formed by the dam below, and each accompanied by a navigation lock to permit the passage of vessels from one pool to the next. Noteworthy examples of canalization by the Corps are the 1,000-mile Ohio River waterway and the 650-mile reach of the Upper Mississippi between Minneapolis and Alton, Illinois. Others are the Illinois, Monongahela, Kanawha, Cumberland, Greene, Tennessee, and Warrior-Tombigbee rivers and the still un-

(Continued on Page 51)

## Army Engineers

finished Arkansas River Waterway.

The navigation pools may provide recreation, water supply, and other benefits. In some cases a series of multiple-purpose reservoirs also serve as navigation pools. The foremost examples are on the Columbia River and the lower reaches of the Snake. Here a series of relatively large dams, containing some of the Nation's biggest powerplants, are being teamed with some of the world's highest-lift navigation locks. As a result, navigation is provided for about 450 miles inland from the mouth of the Columbia.

Artificial navigation channels, called canals, sometimes are excavated through land or shallow water areas. The 1,100-mile Gulf Intracoastal Waterway is to a large extent an excavated canal. The 1,400-mile Atlantic Intracoastal Waterway consists of estuaries, coastwise protected channels, bays, and other natural channels connected by varying lengths of canal. (The term canal also is used to designate large man-made channels designed to carry water for purposes other than navigation—e.g., for irrigation).

Examples of deep-draft open-water canals capable of carrying ocean-going vessels are the Houston Ship Channel, the Sacramento Deep-Water Ship Channel, and the Mississippi-Gulf Outlet. Deep-draft channels, like shallow-draft ones, may be equipped with locks; an example is the St. Lawrence Seaway.

### The Great Lakes

Though in a way an element of the national inland-waterway system, the Great Lakes are a special case. Whereas most other inland waterways are designed primarily to carry shallow-draft barge traffic, much of the shipping on the Great Lakes moves in large vessels of ocean-going size. Natural depths in the Great Lakes range to hundreds of feet.

However, the Lakes, like shallower channels, have required considerable work by the Corps of Engineers in order to meet the needs of modern commerce. Such work has included the progressive improvement of Lake harbors and of the shallow, rapids-obstructed channels connecting the Lakes. These channels have now been deepened to accommodate ocean-going vessels which enter the Lakes through the 27-foot-deep St. Lawrence Seaway.

The Lakes waterways have played

a pivotal part in the industrialization of America, for they provided an economical means of bringing together the iron ore of the western Lake Superior region, the limestone which is plentiful throughout the Lakes basin, and the coal found south and east of the Lakes. This combination of resources was the controlling influence in the establishment of the steel industry, and the subsequent growth of steel-associated industries such as automobile manufacture, in the Lakes region and the Ohio Valley. Grain, originating in the Midwestern plains and destined for the population centers of the East and abroad, is another important cargo. In 1963, the Great Lakes carried about 140 million tons of freight.

### Harbors

The Corps of Engineers has some 750 harbor projects on American sea-coasts and rivers and on the Great Lakes. More than 500 of these are developed for commercial use; the remainder are for recreational and other purposes. The harbors on the Atlantic and Gulf Coasts range from 35 to 45 feet in depth, and on the Pacific Coast, from 30 to 40 feet. Deep-draft traffic in coastal harbors and channels generally amounts to 500 million or more tons per year. Authorized depths of most major Great Lakes harbors now equal the 27-foot depth of the St. Lawrence Seaway.

It is through deep-draft harbors that America's trade with the rest of the world is carried out. Yet the United States possessed very few natural harbors with depths as great as 30 feet. Some important harbors, for example Los Angeles and Houston, are almost entirely man-made. The development of American foreign trade largely depend therefore upon the development of a historically important device—the sea-going hopper dredge—in conjunction with Corps of Engineers harbor work. Such dredges made possible the removal and disposal of the enormous volumes of material involved in the construction and maintenance of deep-draft channels.

In addition to channel-dredging, harbor-improvement work includes the provision of breakwaters, jetties, seawalls, and other protective structures, often of great length and size. The design and placement of these structures may require complex engineering and model studies.

Many relatively small harbors for refuge, recreation, fishing, or other small-boat purposes have been developed. Modern marinas, in which many small craft are moored closely

together, have created new technical problems related to waves and tidal surges. Solutions must be sought on a case-by-case basis, often through the use of hydraulic models.

## 60' ANTENNAE

ROSEMOUNT, MINN. — A huge, 60-foot antenna to be used for feeding information to a navigation satellite was turned over to the Navy. The antenna will help a ship at sea determine its exact position at any time in any weather.



Electronic Specialty Co., Los Angeles, program manager for the antenna and its associated equipment presented the system's key to the public works officer, Ninth Naval District. The Naval Astronautics Group will operate the antenna.

In addition to the 60-foot X—Y antenna and pedestal designed and built by Electronic Specialty Co., the site includes a 40-kilowatt very-high-frequency (VHF) transmitter, a data-reduction center, a self-contained diesel power plant, and living quarters. All of the equipment was installed and checked out by Electronic Specialty Company.

In operation, the system interrogates the satellite to determine the data being transmitted to ships at sea. The data processor then analyzes this information, and computes the necessary corrections for retransmission to the satellite.

This procedure ensures that the information sent by the satellite to ships and aircraft is highly accurate and frequently up-dated. Thus a vessel may make an exact determination of its position.

Electronic Specialty Co. had received a Navy contract in excess of \$1.1 million for its part in the program.



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In this modern world, one of the dominating types of business is the field of construction. The future of the United States is dependent upon its "builders". Those men who, because of their foresight and engineering skills, have, in wood, concrete and steel, constructed many of the modern "Wonders of the World".



Installation of underground control center for Minuteman missile launching facilities at Grand Forks Air Force Base, North Dakota.

One such firm is the Utah Construction and Mining Company whose diversified activities are successfully conducted throughout the world. It has engineered and built industrial plants, canals, tunnels and railroads highways, mills, and mining facilities, industrial parks, complete residential communities and military establishments. Within the Utah organization, is the kind of experience that is needed to solve the many problems involved in planning, engineering and building projects of any size.

In the construction of military establishments and projects, Utah, at the beginning of World War II, turned its vast knowledge and experience to this end. It has participated in many important military construction projects within the continental limits of the United States, and at various sites in and around the Pacific basin. The construction has included naval bases, radar and communication centers, base hospitals, troop barracks and administration centers. Also, warehouses, shops and supply depots, ordnance installations, military highways, railroads and railheads, munition plants, atomic energy facilities and missile base complexes were constructed and with an outstanding record of bringing projects to a successful completion and on sched-

ule. Utah has been a prime contractor or a participant in more than one and one-half billion dollars of military construction.

Among these were the NORAD underground headquarters facility near Colorado Springs, the underground control center for Minuteman missile launching facilities at Grand Forks Air Force Base, North Dakota, Warren Air Force Base and the installation of several hundred Minuteman launching facilities and a network of related launch control centers in Wyoming and North Dakota.

In the West with its thousands of miles of shoreline, with the necessity of waterfront construction and dredging, Utah has brought capability based upon years of valuable and well-rounded experience. And, Utah's activities have not just been within the United States but over the entire world. Recently, Utah Construction and Mining Company was awarded a contract for dredging operations by the 11th Naval District.

In this era of progress, Utah Construction and Mining Company is playing a major role in the development of our country and the **SEABEE** salutes this outstanding western construction firm.



Atlas "F" missile in readiness, over silo built by Utah joint venture.



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## CAPTAIN HAROLD F. LIBERTY, CEC USNR

### AWARDED LEGION OF MERIT

PEARL HARBOR, Hawaii—**Captain Harold F. LIBERTY**, CEC, USNR, of Brockton, Mass., was awarded the Legion of Merit for "outstanding and meritorious service" as Commander of the 30th Naval Construction Regiment in Danang, Republic of Vietnam.

The ceremonies took place here at the headquarters of **Rear Adm. James R. DAVIS**, CEC, USN, Commander Pacific Naval Mobile Con-



Capt. Liberty. CEC/USNR

struction Battalions and Director, Pacific Division, Bureau of Yards and Docks, while military personnel of his dual commands stood in formation.

The tall, husky naval civil engineer, a veteran of WWII and the Korean War, was commander of the regiment from its inception on May 18 to September 1.

The citation, signed by the Secretary of the Navy, read in part: ". . . . this endeavor . . . . unparalleled in Southeast Asia, demanded a wealth of experience, an ability to work with members of other services and a talent for coping with rapidly changing situations. Captain Liberty met these challenges . . . . not only contributing his own knowledge, but inspiring his associates and subordinates to greater efforts in finding solutions to complex problems."

The 56-year-old captain commanded the 112th Naval Construction Battalion P.T. Detachment, responsible for building PT-boat bases in the South Pacific during WWII. He was commanding officer of Mobile Construction Battalion-11 from 1957 to 1960, when the battalion deployed to the Philippines, Guam and Okinawa.

Before assuming command of the regiment, he was assigned to the staff of DIRPACDOCKS, to which he

returned upon being relieved at Danang. He leaves Pearl Harbor in November to become Officer-in-Charge, Construction Battalion Base Unit, Port Hueneme, Calif.

## 5,000 TO 1

PEARL HARBOR, Hawaii — WAVE Lt. (jg) **Margaret M. "Margie" McCARTHY**, USN, daughter of Mrs. **Louis H. McCARTHY**, 11324 Arden Livonia, Mich., (ED. NOTE: FATHER DECEASED) is the only gal in the 5,000-man force that makes up Pacific Fleet Mobile Construction Battalions (Seabees).

In the whole U.S. Seabee organization, one headquartered here at Makalapa and the other at Davisville, R.I., there are just two women. The rest of the force is largely the muscled men with the "Can Do" spirit.

As the Personnel Officer at the Headquarters of Rear Admiral **James R. DAVIS**, CEC, USN Commander Naval Construction Battalions, she's charged with, among other things, the responsibility of keeping the seven Pacific Fleet Mobile Construction Battalions fully manned.

This, in itself, is an important task. Today's Seabees are one of the major construction forces in Vietnam, building airfields, hospitals, entire villages, roads, and camps for the Marines and other U.S. Forces. Their main work has been at Chu Lai and Danang.

**Margie**, although deeply interested in her work with the Seabees, still reverts back to type, so to speak. Her last duty station was the Brooklyn Naval Shipyard, and every time a ship steams into Pearl Harbor, she calmly, but with eyes gleaming, strolls to a window to admire the sleek bow of the ship slice through the water.

The Livonia, Mich., miss is a 1963 graduate of Michigan State University, currently number one in the college football ratings.

"I think I'm going to take leave around the first of the year," she remarked one day.

— Everyone in the office was aware

that the Spartans are favored to take the Big Ten title and clash with a West Coast team in the Rose Bowl New Year's Day.

## W. E. STROUP COMMISSIONED

By **Ronald E. ALLGRIM CEP3 USN**

It was a proud day Friday, 8 Oct. 1965, for **Cdr. R. T. HARDY** of MCB #1 now deployed at Guantanamo Bay, Cuba as he had the honor of



Swearing-in Ceremony

commissioning Master Chief Construction Electrician **William E. Stroup**.



Pinning on the Bars

**Warrant Officer Stroup** has been with this Battalion for 3 years, working with this "Can Do" spirit we are

(Continued on Page 56)



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## BATTALION HISTORY

### MCB-10 FORMERLY 103rd

The 103rd Naval Construction Battalion, later to become the U. S. Naval Mobile Construction Battalion TEN, was formed at Camp Perry, Virginia on 15 October 1943.

The following year the Battalion moved to Port Hueneme, California in preparation for deployment to the Pacific, reaching war torn Guam at the end of the year. Here the Battalion served during the remainder of World War II constructing and repairing facilities for the use of the combat forces. Following the war, the 103rd Seabees remained on Guam where they carried out an extensive job of repair and rebuilding.

On 2 October 1952 the 103rd Naval Construction Battalion was re-commissioned as Naval Mobile Construction Battalion TEN. The Battalion remained on Guam until early 1959 when it was relieved by MCB ELEVEN. The Battalion then returned to its new homeport, the U. S. Naval Construction Battalion Center, Port Hueneme, California, and commenced its yearly cycle of training.

Later in 1959 the Battalion deployed to Adak and Kodiak, Alaska to rehabilitate World War II buildings and carry out a broad construction program of new buildings and roads. Late in the year a detachment was sent to Squaw Valley, California to complete a 125 acre snow compaction job in preparation for the 1960 Winter Olympic Games held there. Once again, in 1960 the Battalion returned to Guam to carry out construction projects. While there a detachment was sent to Canton Island to construct support facilities for Project Mercury.

The 1961 deployment brought MCB TEN back to Adak and Kodiak, Alaska. Then in 1962 the Battalion deployed to Okinawa, sending a detachment to the Philippines to take part in Operation TULUNGAN, the largest amphibious operation since World War II. Later in 1962 another detachment was flown to Udorn, Thailand to land in support of the THIRD Marine Division. This was the first time since World War II that

Seabees had landed in direct support of the Marines.

In 1963 the Battalion deployed to Sangley Point, Republic of the Philippines with a detachment going to Adak, Alaska. Upon return from this deployment MCB TEN participated in a test at Holtville, California of a Construction Battalion's repairing bomb damaged runways.

Once again in 1964 the Battalion returned to Guam where they constructed a badly needed submarine berthing facility. Meanwhile a detachment of MCB TEN was on Midway Island helping to fight the perennial battle of the gooney birds through a bird abatement project.

In April 1965 the Men-of-Ten became the 'Alert' Battalion on Okinawa. This was the jumping off point for an amphibious landing at Chu Lai, Republic of Viet Nam on the 7th of May. Another first was marked up as the Seabees of MCB TEN made the first full scale Battalion landing under Commanding Officers of U.S. Naval Mobile Construction Battalion TEN.

**Cdr M. H. Jordan, CEC, USN**  
2 Oct. 52 to 10 Oct 52  
**Cdr J. F. Dowd, CEC, USNR**  
10 Oct 52 to 2 Nov 53  
**Cdr W. F. Cline, CEC, USN**  
2 Nov 53 to 2 Jul 55  
**Cdr W. M. Brown, CEC, USN**  
2 Jul 55 to 21 Sep 57  
**Cdr J. P. Pollock, CEC, USN**  
21 Sep 57 to 26 Jan 59  
**Cdr N. L. Martinson, CEC, USN**  
26 Jan 59 to 10 Jul 61  
**Cdr R. L. Divoll, CEC, USN**  
10 Jul 61 to 19 Aug 63  
**Cdr J. M. Bannister, Jr., EC, USN**  
19 Aug 63 to 24 Aug 65  
**Cdr T. C. Williams, CEC, USN**  
24 Aug 65 to —

(Continued from Page 54)

so proud of. He enlisted in 1946, made Chief in 1955 and Master Chief in 1961. He has been stationed in Greenland, Little America, Trinidad, Bermuda and Key West, Florida. During his off time duty he has become proficient with both the Pistol and Rifle, winning many awards and honors as a Distinguished Marksman with the Pistol.

He is married to the former **Grace FINNING** and has three children; Donald 16, Robert 11, and Elizabeth 10, now residing in North Kingston, Rhode Island. At the end of this month Warrant Officer Stroup will be leaving for Officer Candidate School at Newport, Rhode Island; from there to CEC School, Port Hueneme, California.

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# Victory

A tremendous victory for right to work supporters was scored yesterday when the Senate voted overwhelmingly against cutting off debate on 14(b). Proponents of compulsory unionism were unable to muster even a simple majority for their cloture motion, far short of the two-thirds needed to adopt the debate-limiting proposal. The vote was **47 against**, and **45 for** cloture.

Capitol Hill observers agree that yesterday's stunning defeat for the union bosses and Administration forces killed the repealer for this session. Debate will probably continue for three or four days, after which Senator Mansfield is expected to take steps for removing the bill from consideration for this year. It is possible, but unlikely, that Mansfield may press for a second cloture vote in an effort to improve the miserable showing made by repeal forces in yesterday's Administration fiasco.

We strongly urge that you immediately write or wire Senators who opposed cloture, expressing your appreciation of their courageous stand for freedom. Opponents of compulsion have won an enormous victory, but the drive of top union officials to destroy Right To Work laws is certain to continue unabated.

Senators who voted against cloture are: Lister Hill, John Sparkman, Ala.; Paul Fannin, Carl Hayden, Ariz.; John McClellan, Ark.; George Murphy Calif.; Gordon Allat, Peter Dominick, Colo.; J. Caleb Boggs, John Williams, Dela.; Spessary Holland, George Smathers, Fla.; Richard Russell, Herman Talamadge, Ga.; Hiram Fong Hawaii; Len Jordan, Idaho; Everet Dirksen, Illinois; Bourke Hickenlooper, Jack Miller, Iowa; Frank Carlson, James Pearson, Kan.; Thruston Morton Ky.; Allen Ellender, La.; Leerett Saltonstall, Mass.; James O. Eastland, John Stennis, Miss.; Carl Curtis, Roman Hruska, Neb.; Alan Bible, Nev.; Narris Cotton, N.H.; Samuel Ervin, Everett Jordan, N.C.; Milton Young, N.D.; Frank Lausche, Ohio; Mike Morony, Oklahoma; Strom Thurmond, Donald Russel, S.C.; Karl Mundt, George McGovern, S.D.; John Tower, Texas; Wallace Bennett Utah; George Aiken, Winston Prouty, Vt.; Harry Bird, A. Willis Robertson, Va.; Robert Byrd, W. VA.; Milward Simpson, Wyo.

Announced against cloture, but not voting: J.W. Fulbright, Arkansas; Howard Gannon, Nevada, Albert Gore, Tennessee.



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## CONTRACTOR PRAISED

Outstanding performance by a building contractor in the construction of a major addition to the Space Systems Center of Douglas Aircraft Company, Santa Monica, California,



has been praised by the Douglas Missile and Space Systems Division.

In special ceremonies at Douglas, Huntington Beach, Diversified Builders of Paramount, California, were commended for their efficiency in completing essential elements of the first of two new engineering administration buildings within the con-

finer of a demanding schedule.

Six other major suppliers and subcontractors also were honored.

At a meeting held in the newly completed structure, R. L. Johnson, vice president-director of the MOL subdivision, presented an engraved Value in Performance (VIP) plaque to **W. M. McCUNE**, president of Diversified Builders. **J. P. ROGAN**, MSSD vice president—operations, awarded pen and pencil sets to representatives of other suppliers and sub-contractors.

Those commended for their support of Diversified Builders in the construction effort were:

Scott Company of California, mechanical work; Amco Electric Company, electrical contractor; E. B. Gardner Company, air conditioning, National Fire Protection, fire sprinkler system; Tri-Way Contractors, tile floors, and a special commendation to Jay Griebel, on-site project superintendent for Diversified Builders.

**E. M. STEWART**, A3 assistant director of facilities, explained that the entire event was designed as an ex-

tension of the Douglas Aircraft Company VIP program to include recognition of outstanding performance by firms doing business with the



Douglas Company.

**B. U. STEWART**, Director of Facilities for Douglas Aircraft, a Commander, CEC-USNR, was on hand to extend his congratulations for a job well done.



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**Port Hueneme**

(Continued from Page 25)

munities of Port Hueneme, Oxnard and Ventura have very good community facilities.

Five hundred new and nearly new family housing units are available on the Center. There are numerous recreational facilities including a nine-hole golf course, two Olympic swimming pools and a skating rink. A line of fully equipped hobby shops are also available.

The Commanding Officer of the Center has been assigned duties as local representative of the Military Sea Transportation Service. The Center's harbor, which is the hub around which many shipping and staging activities revolve, is composed of five wharves and provide 330,000 measured tons monthly outloading capability.

(Continued from Page 34)

urable than the "bridge over the river Kwai."

A few years ago, the Viet Cong reportedly knocked the bridge out of commission but it soon was repaired.

Misfortune struck again last November when disastrous monsoon floods washed away sections of the bridge. After repairs, it was opened again to Da Nang area traffic.

However, the string of bridge mishaps was extended a few weeks ago, when a construction driver drove into both sides of the bridge's narrow single lane sections. The resulting damage forced the closing of the bridge.

Several pontoon rafts and small landing craft were pressed into service as ferries in order to move military and civilian vehicles across the Tourane River, but the urgency in reopening the bridge was evidenced by traffic backups at the ferry landings.

The job of repairing the bridge was assigned to the U. S. Naval Mobile Construction Battalion NINE, which is deployed in East Da Nang. NMCB NINE — widely-known in the Pacific Fleet as the battalion which received the Navy Commendation Medal for its fast, efficient disaster recovery work following the Kodiak earthquake and tidal waves, and also as the winner of the 1965 Admiral Peltier Award (best Seabee battalion in the Navy) — immediately sent repair crews to work around-the-clock on the bridge.

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(Continued from Page 24)

**PATTERNS**

The conventional band patterns in which brick masonry are laid are well known. These are running bond,

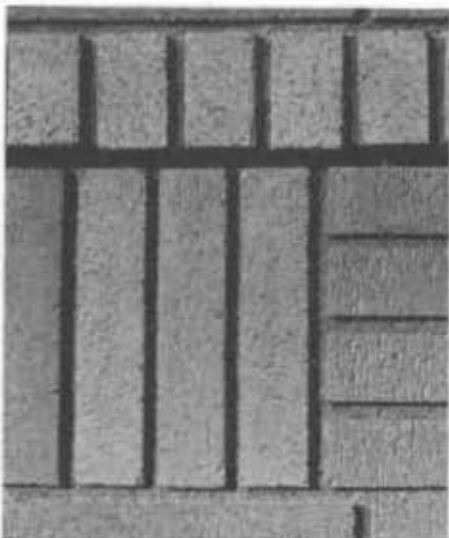


Photo showing intermingling of pattern bonds for detail at roof or floor line. common bond, common bond with Flemish headers, Flemish bond, English bond and Dutch bond.

More recently, a wide variety of contemporary pattern bonds have evolved, which add to the texture of the wall by recessing headers or stretchers.

An integral part of pattern is the size of units.

Face brick in Southern California is available in four basic sizes although other special shapes and sizes may be manufactured for specific designs.

The basic sizes are: Standard, 2 3/16" x 3 1/2" x 7 1/2"; Norman, 2 3/16" x 3 1/2" x 11 1/2"; Roman, 1 1/2" x 3 1/2" x 11 1/2" and Continental, 3 3/8" x 3" x 11 1/2".

While Roman brick are frequently used for paving because they are relatively thin, three sizes of paving brick are also manufactured. These sizes are: 2 1/4" x 4" x 8 3/8", 1 1/4" x 4" x 8 1/2" and 1 1/2" x 3 1/2" x 11 1/2".

**MORTAR COLOR**

The color of the mortar with which brick and tile are laid has a pronounced effect on the appearance of the finished wall. This is particularly true of brick walls in which the area of the mortar joints may approach 25 per cent of the total wall area.

Mortar may be colored in a wide spectrum to blend with the color of the clay unit or to contrast with it. Mortar colors should consist of inorganic compounds and, with the exception of carbon black, should not

be used in quantities exceeding 10 to 15 per cent of the weight of the cement. The use of carbon black should not exceed 3 per cent of the weight of the cement.

In general, best results may be obtained through the use of white sand and white portland cement.

**FLEXIBILITY**

The variety of colors, textures, patterns and sizes available in clay fasonry permits a design flexibility difficult to obtain in any other medium. Infinite variety for esthetic expression partially explains the enduring acceptance of clay products.

Brick masonry, when properly designed and constructed, offers unlimited beauty, low cost, earthquake resistance and a minimum of maintenance. Each of these factors contribute to the overall advantages to be gained by the use of brick.

"Photographs of Face Brick Units manufactured by Pacific Clay Products. Los Angeles Brick division.

(Continued from Page 29)

**PORTLAND CEMENT PLASTER PANELS**  
Smooth Finish

— SERIES I —



MATERIAL: Standard Cement, Type I Mortar Sand, Plaster Sand  
 NET PROPORTIONS: Standard Unit 1.375 lbs. Sand, wetted strength 6000 psi  
 Screen Unit 1.275 lbs. Sand, wetted strength 2000 psi  
 Block Code to be prepared by Stone Manufacturers Association  
 Panel A—4000 psi, Panel B—2000 psi, Panel C—2000 psi, Panel D—2000 psi.

— SERIES II —



MATERIAL: 1/2 Standard Cement, 1/2 Photo Cement, Plaster Sand  
 NET PROPORTIONS: Screen Unit 1.5, wetted strength 1200 psi  
 Screen Unit 1.5, wetted strength 1200 psi  
 Block Code to be prepared by Stone Manufacturers Association  
 Panel E—4000 psi, Panel F—1000 psi, Panel G—1000 psi, Panel H—1000 psi.

— SERIES III —



MATERIAL: Photo Cement, Plaster Sand  
 NET PROPORTIONS: Screen Unit 1.5, wetted strength 1200 psi  
 Screen Unit 1.5, wetted strength 800 psi  
 Block Code to be prepared by Stone Manufacturers Association  
 Panel I—4000 psi, Panel J—2000 psi, Panel K—2000 psi, Panel L—800 psi.

— SERIES IV —



MATERIAL: San Pablo Cement, Plaster Sand  
 NET PROPORTIONS: Screen Unit 1.5, wetted strength 1000 psi  
 Screen Unit 1.5, wetted strength 700 psi  
 Block Code to be prepared by Stone Manufacturers Association  
 Panel M—4000 psi, Panel N—2000 psi, Panel O—1000 psi, Panel P—700 psi.

Each panel of the series will receive a finish coat plaster specially designed insofar as possible to achieve a given strength.

Some finishes will be stronger than the basecoat plaster; some will be equal; and some will be weaker.

The test program is a very limited one. It is not intended to investigate those areas of shrinkage, control joints, unrestrained construction, curing periods and time between coats, which have received attention from various segments of the industry.

In short, it could be summed up in the question: Why does portland cement plaster with smooth trowelled finishes crack more frequently and more severely than portland cement plaster with floated or textured finishes?

It is hoped that a study of the panels will develop additional information from which conclusions may be drawn as to the predictable performance of smooth-trowelled portland cement plaster under a given set of conditions.

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## NAVY TO TO SPEND MILLIONS

Captain J. D. BURKY, CEC, USN,  
Director of the Western Division,



Bureau of Yards and Docks, San Bruno, announces that the Navy will spend more than \$33 million in Northern California and Nevada for housing and other construction as a result of the 1966 fiscal year Military Construction Program Bill. An estimated \$26 million will be allotted to the Bay Area.

Plans call for 208 housing units at the Navy Postgraduate School, Monterey, \$3,350,000; 308 housing units in the East Bay, \$6,450,000; 300 in the South Bay and 300 in the

West Bay, \$4,830,000.

Other projects are: Barracks and Registered Publications Issuing Office at Naval Communications Station, Stockton, \$201,000 and \$234,000 respectively; power at various locations, \$399,000; electric power system, Skaggs Island, \$420,000; Research Facility (to be advertised in October) at the Naval Radiological Defense Laboratory, Hunter's Point, \$665,000, and Bachelor Officers' Quarters at the Postgraduate School, Monterey, \$277,000. The Postgraduate School also received an Academic Facility for \$1,800,000.

Mare Island Naval Shipyard is to receive \$420,000 for a Refueling Facility, \$70,500 for Electric Distribution System, both to be advertised for bids in October. The Pipe Shop consolidation at Mare Island, to be advertised in November, receives \$458,000. Barracks Modernization at the Naval Schools Command, Mare Island, \$363,000 and \$437,000 for a Cryptographic Repair School.

San Francisco Naval Shipyard will receive \$378,000 for a Pump and Valve Repair Facility. The Naval Station, Treasure Island will get \$1,175,000 for a relocation of activities project, \$383,000 for a Heating Plant, and \$2,780,000 for a Barracks. The Naval Air Station, Alameda, has an allotment of \$70,500 for a Crash-fire Facility, and \$588,000 for Barracks Rehabilitation.

The Naval Auxiliary Air Station, Fallon, Nevada, will receive \$177,000 for an Administration Building and \$193,000 for a Chapel. These will be advertised in November.

\$831,000 is earmarked for an Aircraft Systems Training Building at the Naval Air Station, Lemoore. To be advertised in December is airfield lighting at the Naval Air Station, Moffett Field, \$400,000.

The Naval Weapons Station, Concord, receives \$137,000 for Electrical Distribution Conversion (to be advertised in October), \$110,000 to extend a sanitary sewer, and \$265,000 for a Quality Evaluation Laboratory.

Military Sea Transport Headquarters at Oakland has an allotment of \$495,000 for Administrative Facilities.

It is expected that most bid invitations will be issued in the period of October through January.

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